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The Steel Industry in a War Economy

by

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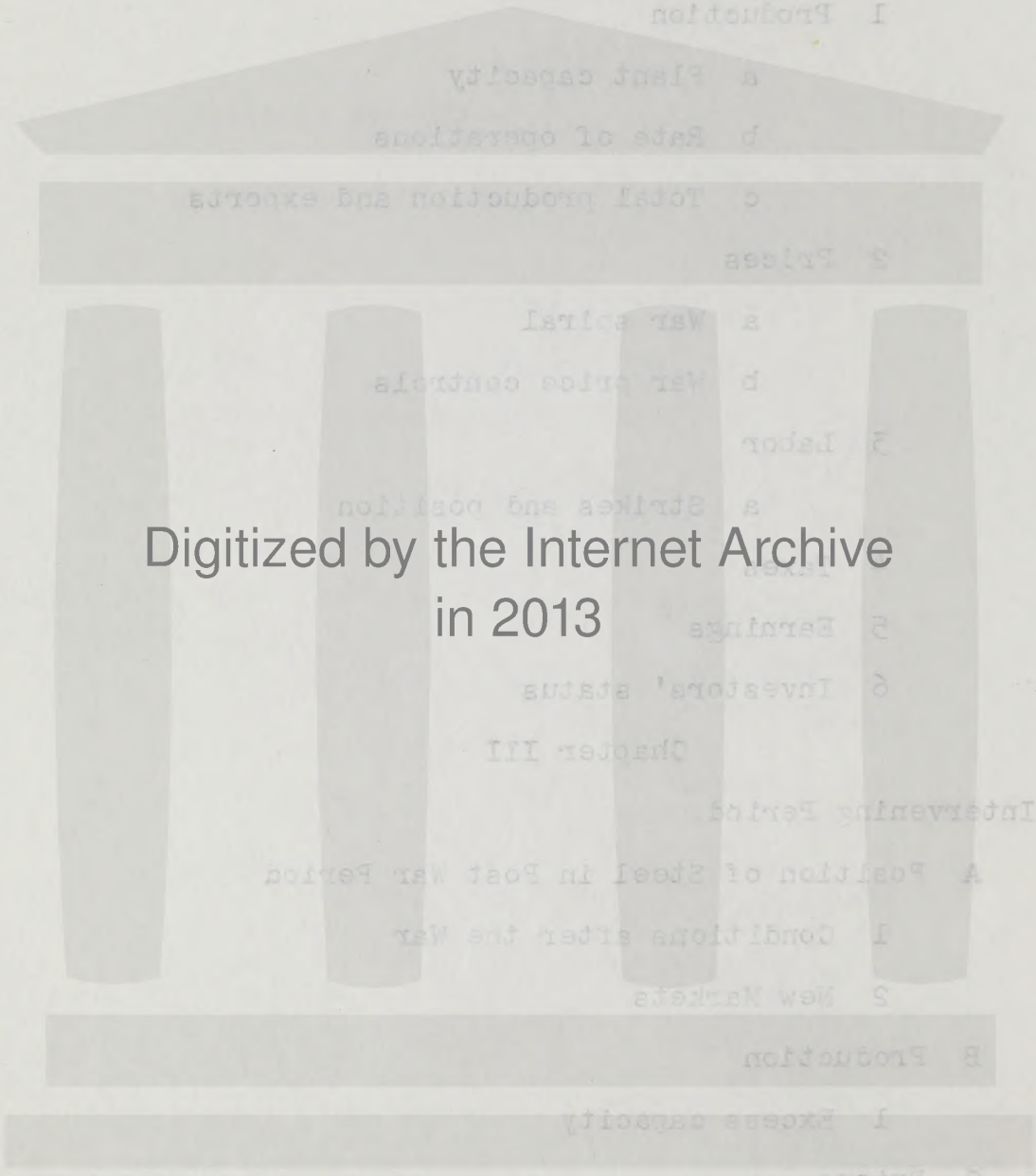

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Introduction

Iron is the foundation of industrial civilization. It is the raw material for mechanical marvels and the implement, the uses of which can banish want or destroy humanity. It has been said that the key to America's wealth lies in her ore beds. From these beds we get steel; from steel the rails that span the continent, the plows, harvesters and tractors that help pour nature's abundance into our laps; and the machines that transform a raw material into a finished good. Iron has always been prized and for it there is no substitute. Herman Demarest Lloyd has called it "The Bread of Industry".

Its production is the important single industry in a country. Using an invested capital of over four billions of dollars in the United States, the industry turns out approximately that value in products in good business years and accounts for almost 7% of the total value of industrial production in such times. It employs over one-half million wage earners and has total payments amounting to almost a billion dollars annually. In order to produce 48,000,000 tons of steel in 1928, the industry had to handle 200,000,000 tons of raw material - iron ore, coal, coke, limestone etc. One million men had to work for an annual wage of $1,400,000,000. and produced a metal worth $3,000,000,000. from which goods were fabricated for which the ultimate consumer paid $7,000,000,000. Steel companies are the biggest coal operators.

Introduction

They dominate ship building and operate their own shipping lines. On the Great Lakes the Steel industries have a navy which combined totals 819 ships of 4,457,000 tons. They are the biggest manufacturers of cement, a by-product from slag from the furnaces.(1) On this basis, along with the fact that steel is the most widely used of all metals, the Steel Industry warrants the designation of a key industry in highly industrialized countries.

Its tremendous volume of operation and its multiple uses in other industries have enabled statisticians to consider Steel as a barometer of general industry. Since the finished product of the steel mills is virtually the raw material for all other industries, steel fluctuates in accordance with the cyclical fluctuations of business. Production records clearly indicate that cyclical and random forces outweigh any seasonal tendencies in output.

Output moves in relatively short cycles - never having gained for more than three consecutive years and never declining for more than two. The great impetus to steel was the World War, 1914-1918. Due to the depression of 1912, the industry was slow at first to capitalize on the war demand due to negligible foreign orders and domestic fear. When the world realized that the war was to be a long one, foreign orders poured in and domestic activity awakened. From the middle of 1915 to 1918 the industry soared. Production was

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(1) Steel Dictator - Harvey O'Conner N.Y. 1935 p.28.

(1) Steel Dictator - Harvey O'Connor N.Y. 1935 p.29.

on a twenty four hour basis with 100% of capacity constantly utilized. Growth and expansion were twins. The depression of 1921 caught the steel industry with a tremendous excess capacity and little demand to use it. However, the rise of the automobile industry in this decade pulled the steel industry out of the doldrums along with the tremendous business activity and rise to the high peak of 1929. The decline in production after 1929 was unprecedented in both duration and extent with output falling from a daily average of 166,666 net tons in 1929 to 40,774 net tons in 1932 - the lowest since 1901. As a consequence, the subsequent rise in output also flouted previous standards. Production rose for five consecutive years after 1932 before turning down in 1938.

Yet, Iron mixed with blood is the main ingredient of war. Steel tanks, shells, shot, shrapnel, armour-plated warships and bayonets are the stuff of battle. Bismark is reported to have said that "the great questions of the day are to be decided not by speakers and majority resolutions..... but by blood and iron." Blood and iron in sufficient quantities and applied with the proper technique is the final answer of capitalism to its own contradiction. And these problems are likely to arise from iron. For example, the Lorraine for 70 years has seen blood to determine whether the French or the German steel magnates are to rule its iron ore deposits ..... the most important in the world next to those of Lake Superior. Usually iron and steel masters do more than supply war's most

telling arguments in the shape of death utensils and poison gases which steel passes off as a by-product. They are also willing to subsidize war scares to help along their business. They found Security and Navy Leagues to stimulate a steady demand for their wares and hire propogandists to break up international peace action. Imports of iron and steel, they declare, are a form of international robbery inflicted on the domestic working man. Always the steel masters are strident patriots, enthusiastic for preparedness and never adverse to a profitable war.

History has proved that a war was the best customer of the steel industry. It received its impetus in the Civil War. The Spanish-American war gave Andrew Carnegie millions with which to assume his philanthropic work. The World War was the zenith for steel. Steel had come into its own - a powerful force in the industrial world. After the war, production techniques were altered to conform to domestic needs. The post war slump was minimized by the expanding automobile demand for light steels. This demand increased steadily through the decade of the twenties. Since the collapse of twenty-nine, any pertinent trend of the industry has been overshadowed by the economic and financial maladies.

The industry today is in its intensive era, deeply rooted and unwieldly. Its tremendous bulk requires high capacity operations for efficient and profitable returns. The present defense program is in a way made to order for the steel

industry. It is lifting the industry out of a state of apathy to renewed activity. Just where it will leave the industry is a matter for speculation only.

The purpose of this thesis is to understand the effect of a war economy upon the industry and more specifically upon production, prices, labor, taxes, earnings, and security status. The occurances in the last war will be the basis of comparison and contrast with the present. In the conclusion, after surveying the industry from an investment viewpoint, there shall be an attempt made to evaluate the placing of steel securities in a portfolio that desires appreciation.

Helen Chester

Chapter II

Economics of Steel

In the younger days of the industry the idea was the bigger the company, the more economically it could be operated. This conception of the steel industry was not unwarranted for steel manufacture entails huge, heavy fixed costs and large scale operation. A modern blast furnace requires an investment of approximately from four to six million dollars and the larger furnaces produce as high as 1,100 tons of pig iron in a day. This example indicates that the steel industry has been through the years and still is geared to "bigness", and as a result it has to face all the problems of inflexibility. Normally in any industry the cost of production varies with the rate at which capacity is utilized. Operating ratios fluctuate with the extreme shifts characteristic of demand. Changes in demand, under competitive conditions, cause a minimum economic disequilibrium for they engender an adjustment of costs, output, and prices. However, the inherent inflexibility of steel capacity tends to prevent such an adjustment.(1)

As a result, there are two points of view in considering a steel plant or an ore mine:- (1) as an investment that must be protected, and (2) as an instrument of production to be

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(1) Report of the Federal Trade Commission on War Time Profits and Costs of the Steel Industry. Feb. 18. 1928. p.7.

Chapter 12

Economics of Steel

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(1) Report of the Federal Trade Commission on War Time Profits and Costs of the Steel Industry. Feb. 16, 1928. p.7.

cherished as long as it cannot be replaced by a more efficient instrument. The former is the banker's point of view; the latter, the Industrialists. The United States Steel Corporation is an example of the former. With hundreds of millions of dollars invested in plant and eqipment since birth, the interest of the Board of Directors has been the prevention of deterioration in the investment value of the properties. To accomplish this, the Board has attempted to freeze the entire industry at present or past levels without seeming too agressive in its manner. Judge Gary was the first to do this. He kept the industry under his control by means of the bigness of the United States Steel Corporation. As earnings increased, he avoided paying overlarge dividends. Instead, he invested a large part of earnings back into the plant, which gave more hostages to be protected. The more money spent in the plant put the Corporation in a defensive position. In other companies, the industry was managed by steel masters and followed somewhat the banker policy of the Corporation, content to take no risks, but to operate with modest but safe objectives. They could have competed with the United States Steel Corporation, but Gary's umbrella over prices gave them a nice tidy profit. Furthermore, thiswas not the era of the American pioneering spirit. Lately, this industry has seen independents, like National, that are breaking out of the ranks, but, on the whole, the industry is still suffering from a heritage of three decades of inertia. The Corporation and the industry

have been and still are hampered by a financial rather than an industrial orientation.

The financial orientation proved that technological changes render millions of plant investment worthless and so there was little contribution made to the art of making steel. This explains why the United States Steel Corporation was late in constructing a continuous strip mill, getting into alloys, and even yet has not adopted a full combustion control on its open hearth furnaces. The policy has been "no inventions and no innovations". Technologically, the United States Steel Corporation is one of the most backward of our major industries. The problems are great, because experimentation on a large scale is expensive. Germany is the leader here. We had to learn about stainless steel and how to save millions by using coke ovens from her. In the last decade, the Corporation has improved its methods of rolling steel and is using a continuous strip mill. There is also progress in metallurgy, especially in the malleability of steel, making possible round fenders and bending pipes, although very little has been done about the blast furnace and open hearth design. In an analysis in 1925 before the American Institute of Mining and Metallurgical Engineers, Charles Ramseyer said,

> "Actually, the operation of its (Iron and Steel Industry) basic process has not changed fundamentally in either theory or fundamental design of equipment in the past 75 years. Though many other process industries have been born and developed, and not seldom completely revolutionized methods during this period, the primary process of making iron and steel are still carried on along the lines laid down, and

in equipment orignated so long ago by Bessemer, Siemens, and Martin and subsequently expanded to practically the modern scale by Carnegie, Schwab, and Captain Bill Jones in the 1880's and 1890's. (1)

Cost of Production

The United States Steel Corporation in a report to the Temporary National Economic Committee on February 5, 1940 stated that $182,100,000. is spent on fixed costs regardless whether the volume of business is 17% or 90% and the average costs of each weighted ton of product shipped amounts to $55.73 per ton.(2) It is easily seen that the cost of producing steel is great. This explains in part why the industry has been termed "the prince and pauper", - the prince among industries, but a pauper in its returns to investors due to its fixed costs. The following chart and table illustrate the average relationship between Volume and Costs in the operations of the United States Steel Corporation and subsidiaries as indicated by the costs of each of the years 1927 to 1938 adjusted to 1938 conditions.

Relationship between Total Costs of Operation and Volume of Business ⊖-- 1938 Conditions.
U.S. Steel Corporation and Subsidiaries. (3)

Year	Millions of Weighted Tons of Products Shipped.	Costs - 1938 Conditions - Millions of Dollars.
1927	13.0	954.5
1928	14.0	966.2

1. Fortune - March, 1936 p. 123-4
2. U.S. Steel Corp. T.N.E. C. Papers Vol.II Chart Studies p53
3. After a chart in United State Steel Corp. T.N.E.C. Papers Vol. II p. 52.

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1. Fortune - March, 1938 p. 128-4
2. U.S. Steel Corp. T.N.E. C. Papers Vol.II Chart Studies p83
3. After a chart in United State Steel Corp. T.N.E.C. Papers Vol. II p. 82.

Year	Millions of Weighted Tons of Products Shipped.	Costs - 1938 Conditions Millions od Dollars.
1929	15.1	979.0
1930	11.9	838.8
1931	8.1	628.9
1932	4.4	436.0
1933	6.2	512.0
1934	6.1	510.0
1935	7.6	610.3
1936	11.0	818.2
1937	13.2	916.2
1938	7.8	614.3

Average relationship: Cost - $182,100,000. plus $55.73 per weighted ton of products shipped.

Total Costs are adjusted to 1938 prices.

Weighted tonnages are actual tonnages.

Year	Millions of Weighted Tons of Products Shipped.	Costs - 1938 Conditions Millions of Dollars.
1929	16.1	970.0
1930	11.9	832.8
1931	8.1	688.9
1932	4.4	436.0
1933	6.9	612.0
1934	8.1	810.0
1935	7.6	610.3
1936	11.0	818.2
1937	12.2	916.2
1938	7.8	614.3

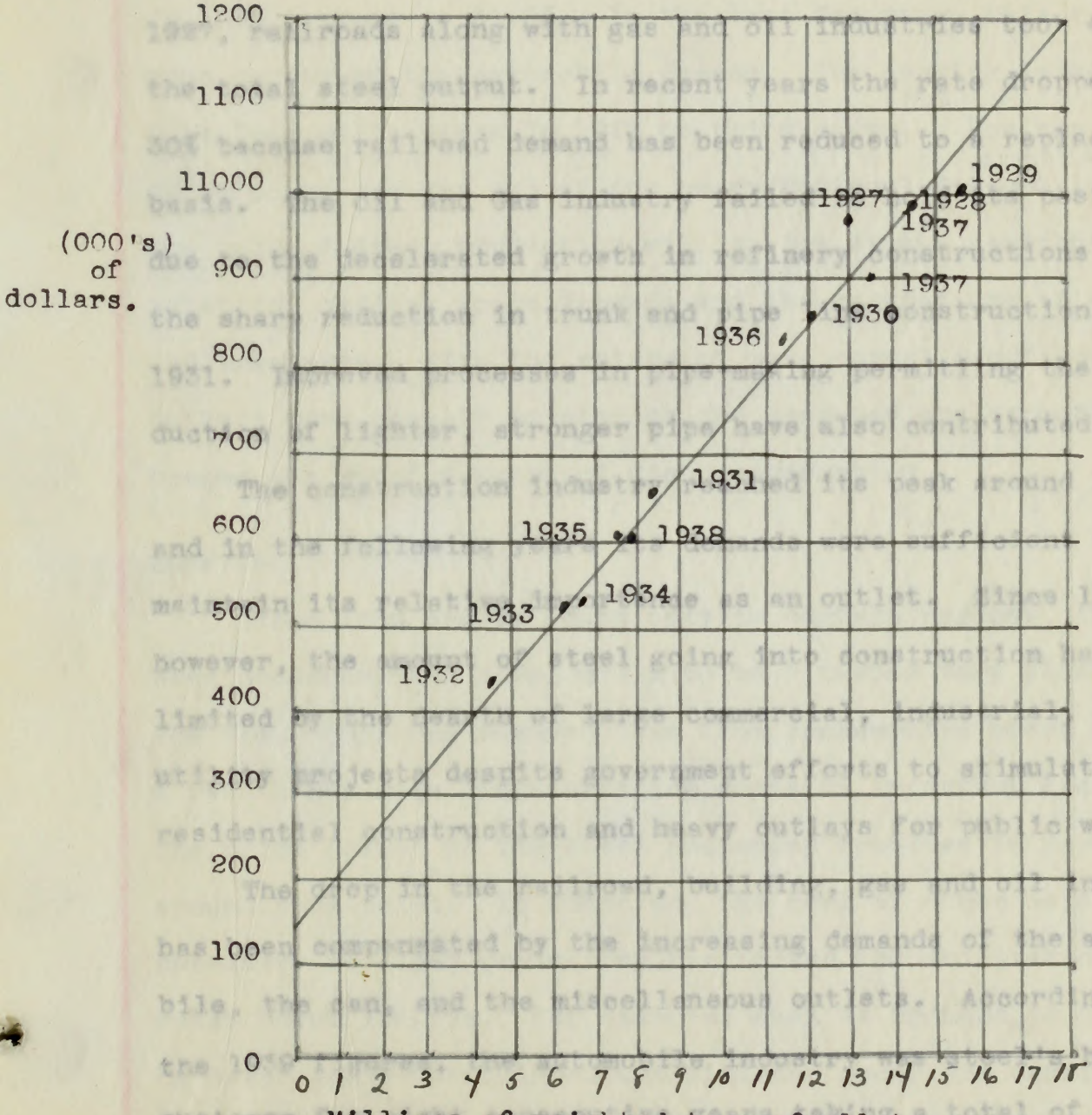
Average relationship: Cost - $182,100,000. plus $55.75 per weighted ton of products shipped.

Total Costs are adjusted to 1938 prices.

Weighted tonnages are actual tonnages.

RELATIONSHIP BETWEEN TOTAL COSTS OR PRODUCTION AND VOLUME OR BUSINESS * 1938 CONDITIONS

U.S. Steel Corporation and Subsidiaries (1)



Note. Total costs adjusted to 1938 price level and to 1938 effeciency.

(1) After a chart in U.S. Steel Corp. T.N.E.C. papers Vol. II. p. 56.

RELATIONSHIP BETWEEN TOTAL COSTS OR PRODUCTION
AND VOLUME OR BUSINESS * 1938 CONDITIONS

(1) U.S. Steel Corporation and Subsidiaries

Note. Total costs adjusted to 1938 price level and to 1938 efficiency.

(1) After a chart in U.S. Steel Corp. T.N.E.C. papers Vol. II, p. 56.

Variability of Markets

The relative importance of consuming lines has changed considerably. While the railroads and the building industry were the major outlets in the twenties, today the automobile industry and the miscellaneous outlets hold first place. In 1927, railroads along with gas and oil industries took 45% of the total steel output. In recent years the rate dropped to 30% because railroad demand has been reduced to a replacement basis. The Oil and Gas industry failed to hold its position due to the decelerated growth in refinery constructions and the sharp reduction in trunk and pipe line construction since 1931. Improved processes in pipe-making permitting the production of lighter, stronger pipe have also contributed.

The construction industry reached its peak around 1926 and in the following years its demands were sufficient to maintain its relative importance as an outlet. Since 1931, however, the amount of steel going into construction has been limited by the dearth of large commercial, industrial, and utility projects despite government efforts to stimulate residential construction and heavy outlays for public work.

The drop in the railroad, building, gas and oil industry has been compensated by the increasing demands of the automobile, the can, and the miscellaneous outlets. According to the 1939 figures, the automobile industry was steel's best customer for eight consecutive years taking a total of 5,396,000 net tons or 16.7% of the total shipment of finished

steel. The last decade has witnessed the huge change in the miscellaneous field. In 1929 this group which includes household equipment, refrigerators, stoves, furniture, hardware, office equipment, bolts, nuts, and rivets took a combined total of 19% of the total shipment of finished steel whereas in 1939 it rose to 31.3%. In the last few years this group even surpassed the automobile demand. The canning industry rose from sixth place in 1927 to third today.(1) For the duration of the war and of the heavy National Defense spending, the bulk of steel production will be for export, shipbuilding, aviation, capital goods demands and the manufacture of munition and armaments. With the return of more normal conditions, outlets more closely related to the consumer are expected to become the chief support of steel consumption.

Location

Since iron ore is found only in certain regions, it has been necessary for steel mills to be situated very closely to the ore. This has removed them from consumptive areas and as a result has made transportation costs an important factor. The price policy of the steel companies revolves in part around this point. In addition, the need of other materials necessary to steel production has forced the utilization of water borne traffic. For example, coal is brought to the mills by water and semi-finished and finished goods are carried back.

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(1) Moody's Standard Trade and Securities p ST 14-16.

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(1) Moody's Standard Trade and Securities p ST 14-16.

There is no danger of steel mills moving for building new rolling mills elsewhere means the creation of new plant capacity when there is idle capacity representing huge investments lying in Pittsburgh and Youngstown.

Prices

The steel industry has enjoyed price fixing for many years through the mediums of pools, agreements, zoning price systems, Gary dinners, mutual understandings, single basing point system (Pittsburgh plus) and the multiple basing point system. There exists an interrelation of price fixing with limitations on new productive capacity. The steel industry desires to avoid the entrance of new units -- low cost units -- if the price structure is to be maintained. Yet all and any competition in the industry centers around prices (price concessions) and will continue.

Theory

The main idea in the background is how is a company to get the enormous orders necessary to keep mills running at a profitable rate? The basing point system survives because it is the best solution as yet. Lower prices are not steel ideology which is odd when you consider that prices are the only important factor in steel buying. Since steel manufacturers are afraid of cut-throat competition, they have never agreed that more sales come from reduced prices. They maintain that steel itself is a small part of the cost of the

finished article made from it. Therefore, a cut in prices would stimulate demand very little. Example, steel used in an automobile costs $31.41 or 4.6% of the total cost. A 25% cut in the steel price would result in a 1.15% cut in automobile costs. Moreover, since the demand for steel fluctuates with general business, it is little affected by prices. As a result, steel men are geared to an industrial philosophy of high prices and restricted production -- prices set at a high enough level to yield a profit when plants are running at 40% capacity; at 60% capacity profits are sizable, and at 85%, fabulous.(1)

Price stabilization has been the dominate desire rather than high prices. A producer must publish his price and if it is lowered, the new lowered price becomes the base price for all companies. This policy was carefully laid down by Judge Gary in the initial days of the United States Steel Corporation. His belief was that if all competitors lowered their prices to meet the new base, nothing has been gained by the action but the incentive to reduce prices is removed. Theoretically, price stabilization fails to stabilize production -- the fundamental aim of the steel producers, for if prices remain and demand keeps increasing there will come a time when production will have to increase and vice versa if prices remain and demand falls off to a large extent, production will fall off too. Therefore, in order to stabilize production, steel men ought to try to stabilize demand.

(1) Fortune April 1936 p. 130 - 131.

However, prices are not as rigid as one might be led to believe. The public price is only an opening bid and bargaining occurs after that. President Girdler of Republic Steel has proven this point when he moved into Detroit next to the automobile industry to do away with transportation costs and began his drastic policy of price concessions. Criticisms of the present price policy have labeled it as artificial, wasteful, discriminatory, and uncompetitive. The steel industry is one in which there is limited competition because producers and consumers are centralized. Eighty-five percent of the steel produced goes to 1200 customers. Steel buyers are divided into two groups, one the small aristocracy big and strong enough to force competition, and the other the vast proletariat of little fellows who have to take it. In 1934

100	customers	bought	42% of total tonnage shipped
3	"	"	91% of auto steel
3	"	"	90% of tin plate
10	"	"	90% of railroad steel
2	"	"	20% of structural steel. (1)

One united phalanx faces another.

Basing Point System

The Pittsburgh Plus was the name given to the price system established by Gary. He decided the price of steel to a consumer would be that of the finished product price plus all freight transportation costs from Pittsburgh regardless where made. The rise of Chicago as a steel center with Pittsburgh as the basing point made the system unpopular. In 1924, the

(1) Fortune April 1936 p. 127.

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100 customers bought 42% of total tonnage shipped
3 " " 21% of auto steel
8 " " 80% of tin plate
10 " " 80% of railroad steel
9 " " 20% of structural steel. (1)

One united chain faces another.

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(1) Fortune April 1936 p. 127.

Federal Trade Commission ordered its abolition. The United States Steel Corporation agreed to comply, but retained the fundamental theory by increasing the number of basing points. There were three in 1923, nineteen in 1924 and by 1927 there were twenty-nine. The N.R.A. and the steel Code in 1933 increased the number to forty five and by March, 1940 there were eighty. "However, there usually remained a differential at other basing points over quotations at Pittsburgh on the same price."(1) On June 24, 1938 the United States Steel Corporation announced sharp reductions in many products for the third quarter, but also set identical prices at various basing points eliminating the differential which previously existed. "The general elimination of differentials between the major basing points has in effect, disrupted the fundamentals of the system and encouraged the development of widespread competition such as that witnessed during June and October 1938, May 1939, and April 1940."(2)

Under the Pittsburgh Plus, the Corporation becomes a policeman having 65% of total ingot steel capacity. All it does is set the price and sees it automatically followed. The Pittsburgh Plus is a classic example of an artificial price structure. The principle is simple. When the base price for steel is $40.00 a ton in Pittsburgh and the transportation costs to the consumer's door are $7.60, the price of steel is

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(1) Poors, Steel and Iron Industry Survey p.S2-13
(2) Ibid., p. S2-14.

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(1) Foora, Steel and Iron Industry Survey p.32-13
(2) Ibid., p. 32-14.

$47.60. If steel is produced in your city and you wish to purchase it at the neighboring mill, you still pay the base price for steel in Pittsburgh plus transportation costs if it were sent to you from Pittsburgh even though you walked into the neighboring mill and procured the steel yourself. It is obvious that the huge United States Steel Corporation maintained these rigid prices in order to remain in competition with the more conveniently located companies.

The Temporary National Economic Committee conducted a monopoly investigation on the steel industry in late 1939 and early 1940. The government took the stand that price reductions in steel during periods of bad business would stimulate the nation's entire economic machinery without adversely affecting the income of steel producers. The steel manufacturers answered this charge by saying that the inelastic nature of the steel demand and the production costs led them to the conclusion that price reductions would not increase industrial activity sufficiently to offset the expenses involved in lowering the already small profit margin. Something can be said for both sides. The Temporary National Economic Committee is delving in theory and the law of supply and demand while the steel industry is presenting statistical facts and findings. On the other hand, many who know the industry state that profit margins are too low,(1) which also explains the reluctance to lower prices.

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(1) Poor's Steel and Iron Industry Survey 1940 p.S2-14-15

Management

The pertinent problems of Management in the last decade have been financial, operation, sales, organization, and personnel. Each company has been and still is faced with these problems - some like the United States Steel Corporation to a greater extent than others. Financial problems have in the main revolved around rehabilitation of plant and equipment, taxes, indebtedness, and capital structure. The companies which have installed continuous rolling mills found their return very handsome from the light steel market. National Steel was the first to do this back in 1927. As a result, she alone stood out in the depression and produced an amazing sales volume and earnings record from 1932-1935.

United States Steel on the other hand was a sad story. Heavy indebtedness, interest charges, rising taxes, and labor costs were too powerful to present a favorable record during the depression years. Myron Taylor set out to correct these problems and made out fairly well. He retired many subsidary bonds, cut interest charges, improved plant and property, went after and got a good share of the automobile trade, organized the sales policies, whipped the Corporation into one harmonious whole instead of several separate entities and put new blood in the personnel.

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years. Deterioration of plant is shunned because of the large initial investment. In short, there is need for a change in the United States Steel Corporation or else it will become a corpse embalmed in a strong financial position. However, any forthcoming change will be slow due to its size and unwieldly bulk.

Other Steels

Light Steel:

Since 1926 a total of 26 continuous sheet and strip mills have been placed in operation with an approximate capacity of 16,929,000. net tons. Although but few more mills of a wide variety are expected to be built in the next few years, it is likely that additional continuous rolling mills will be constructed. Contributing to the demand is the rapid change from hot rolled tin plate to a cold rolled product. The trend of both hot and cold mills is for increased speed and, therefore, for larger capacities. This emphasis on finishing mill construction has resulted from the demand for a great diversification of finished products and heavier orders from the auto and tin plate manufacturers. The new continuous mills are fast rendering obsolete not only the old manually operated, but even the original continuous mill. Companies having the new facilities or the resources and the courage to build them are better situated to take advantage of the new preferences for light and corrosion-resisting steel and steel alloys. Expanding light steel capacity is subject to increased competition and is reflected in instances of price cutting, mainly due to the

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strong bargaining power of the automobile industry which is the largest consumer of steel sheets and strips. With new markets expanding rapidly, prospects over the longer term are for satisfactory price levels.

Inasmuch as modern armaments frequently are made from specifications requiring electric furnace steel, there is a sizeable expansion in 1941 for thistype of plant facility. The expansion under way should increase annual capacity by 500,000 net tons. Expansion in the consumption of light steel has steadily been in evidence during recent years. It is estimated that 45% of the total finished steel products for sale by the industry in 1939 consisted of light steel including steel sheets and strips, tin plate and wire products. In 1936 and 1937, light steel was equal to 43% of total finished steel products and in 1938, 46.3%. This low rate of increase over the year is attributed to a sharp decline on the parts of the building, automobile, and railroad industries. The present reviving demand from the automobile industry, the further cyclical expansion of construction activity, and the potential higher demand from the railroads point to the maintenance of a heavy steel consumption ratio at levels close to or slightly above the 1937-1938 figures. It is true that heavy steel is required for the defense program and for two naval fleets, but after that what? The demand will shift to light steel. Already it has gained a position of leadership over the heavy steels due for the most part to a reduced relative importance of the heavy

steel users (the building and the railroad industry and the rise of the automobile, container, and the miscellaneous industries). That there has been a definite shift in demand has been evidenced in recent years. The current trend is toward an increased use of steel in the construction of residences and garages, filling stations, shops, small buildings, furniture, stc. - all promising light steel outlets. Moreover, we see the tendency towards light weight railroad equipment both for passenger and freight service. The conclusion is that the growth of light steel is not a temporary phenomenon, but a permanent transition and its peak is nowhere in sight as yet. Aside from defense orders there is little evidence of any underlying growth in the consumption trend of heavy steel. It is more likely that production of heavy steels in years to come will still be characterized chiefly by wide variations rather than by any strong uptrend.

Alloys:

Alloy steels did not assume any commercial importance until the time of the World War. Since then research sought to develop steels with such desirable properties as greater unit strength with consequent weight reduction, superior resistance to heat, abrasion, corrosion, and fatigue etc. The tendency is distinctly in keeping with the trend toward greater specialization in the demand for steels. Because of its potentialities, all steels are devoting considerable attention to them. For all as yet, alloy steel is a minor part of the business. Some

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smaller units have devoted all their attention to them. (Vandiann Alloys, Firth Sterling, Jessup, Universal Cyclops and Rustless Iron). In the larger companies, only Alleghany-Ludlum, Crucible, and Republic Steel are seriously interested. The rapid growth of alloy steel demand from less than 1% of total steel output in 28 years is not to be overlooked. Alloy steel production alone jumped 56% in 1936. The most important consumers of alloy steel are the automobiles, machine tools, and the railroads. Since these industries are vulnerable to business conditions, so is alloy steel.

The war demand for alloys should be heavy in view of the broader use of such metals. Examples. Bullets are now made of steel and nickel. Airplanes consume many types of alloy steels, while mechanized war equipment will require lighter steel for some purposes and durable alloy steels for others. For the duration of the National Defense Program machine tools, shipbuilding, aircraft, and armaments will rise in relative importance as alloy steel users and the automobile,industry's traditonal leadership will be threatened, but only temporarily and eventually it will be re-established. Undoubtedly, the war will promote a trend toward diversification of outlets.

Since the alloy industry is still in its infancy, it will have to get consumer acceptance before it makes any headway. Prices differ as widely as the formulas and vary from $55.-$700. a tone for the more common types. Price reduction must await improvements in methods of manufacturing. Although the

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Estimated Distribution of Alloy Steel (1)
(unit %)

	Auto	Machine Tool	Oil	Agricul.	Const.	R.R.
1939	54.7	7.3	1.1	1.7	1.7	3.2
1938	54.0	6.9	1.8	1.8	1.7	5.4
1937	59.7	6.8	0.9	1.9	0.7	1.7
1936	59.8	6.6	1.1	3.0	0.5	1.0
1935	72.2	4.5	1.8	2.9	0.9	0.6
1934	53.3	4.9	1.5	2.4	1.5	0.6
1933	68.3	3.6	2.0	2.1	0.7	0.3

	Export	Shipb.	Miscell.
1939	3.9	3.6	22.8
1938	2.4	1.4	22.6
1937	7.0	0.4	20.9
1936	7.0	0.4	20.6
1935	2.3	0.4	14.4
1934	4.1	1.2	30.5
1933	0.9	0.5	21.6

Plastic Threat:

There has been increased rumor that plastics will replace iron and steel especially in the automobile and construction industry. Many surface parts of automobiles are made of plastic wood, but there are also many inherent difficuties that hamper

(1) Standard Statistics: Standard Trade and Securities, Steel and Iron. Basic Survey PartI, Oct. 4,1940. Vol.98 No.2 Sec 2. P.S1-17

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complete usurpation by plastics. It is true that they are in direct competition with die casting alloys. Their advantages are lightness of weight, smoothness of surface, and no external finish. Nevertheless, metals are still better conductors of heat, are also electrical conductors (plastics are not), and are usually cheaper per pound. Die castings are stronger than moulded plastics, because they have greater heat resistance qualities and are malleable. Furthermore, they can be used in complex designs, permit greater variations in section thickness, yield higher dimensional accuracy, and usually permit higher production ratio.

Plastics will not replace sheet metal completely in the automobile industry, because obviously, if another metal would save weight, reduce production costs without hampering the quality or the performance, sheet metal would be discarded. However, before they can be accepted, plastics must have a tensile strength of 40,000 pounds per inch (estimated) and the modulus of elasticity must increase from 12 to 15 M. In addition, plastics must be able to withstand the effects of low and high temperatures much better than the present ones do, as well as become fireproof, shatter proof, and more amendable to repair. Much remains to be done in the field and the alert steel industry will make adequate provisions to meet this competition.

Chapter II

World War No. 1.

When the last World War broke, the United States was in the midst of a depression. The peak of business prosperity was reached in the fall of 1912. A change in leadership in Washington and the question of the tariff were contributing causes to the downswing. Congress legislated to open our markets to sharp foreign competition by the Underwood Tariff which became effective in October, 1913. The Mexican disturbance became an element of fear that our occupation of Vera Cruz would lead us into war. The European war dislocated commerce and finance throughout the world and caught the United States at a time when the new tariff involved us heavily in debt to foreign countries. The sudden demand for gold, not only to meet our indebtedness, but to take up a considerable bulk of our securities thrown on our markets by foreign holders, brought about a stringency of credit and currency which almost paralyzed business. This condition was relieved somewhat by the issuance of emergency currency on the part of the United States Treasury.

The favorable developments at the time were overshadowed. Farmers had good cotton and wheat crops in 1914, but suffered from conservative buying. The opening of the Panama Canal in August, 1915 was clouded by the European war. The outbreak of war abroad led to the belief of big orders here. We received a few at first, but not the reflex anticipated.

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Position of Steel

Prior to the war, Germany and England were the world's great producers of steel with Germany assuming leadership. With these nations embroiled in warfare, America stood alone as a producer to supply all wants. In 1912, our capacity stood at 2,900,000 net tons, 3,000,000 in 1913, and by 1914 our capacity had increased to 3,300,000 net tons of steel. We were in a position to well take care of increased orders even with this capacity, for actual production of steel in 1914 fell from 2,500,000 net tons to 1,700,000 net tons.(1) It must be remembered that 1914 was a very distressing year for steel. Almost every manufacturer had to draw on surpluses accumulated in better days to meet current expenses. Manufacturers became so alarmed over the conditions of the trade that the American Pig Iron Association instituted an inquiry into the relative costs of production prices at which members were selling. The inquiry found that the average loss in February of that yeaf was 95¢ per ton.

As foreign demands increased, steel production picked up. At first, sales were not heavy and the United States Steel Corporation was making most of them.(2) In 1913 the country had 183 open hearth steel plants of which 158 of them were active and 25 idle. Producing capacity was located in four districts.

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the states of Pennsylvania, Ohio, and West Virginia converge.

2- Youngstown- Cleveland area some one hundred miles north of the Pittsburgh district.

3- Chicago and environs

4- the region around Harrisburg, Bethlehem, and Baltimore.

Plant capacity was rapidly increased during the war year. Each year saw tremendous increases. For example,

1914 - 3,300,000 net ton capacity
1915 - 3,400,000
1916 - 3,800,000
1917 - 4,150,000
1918 - 4,375,000 (1)

Actual steel ingot production during the war rose from 25 million to 48 million tons with capacity operation rising from 59% to 94% - the high point reached in 1918. Example.

	Production (million tons) (2)	Capacity Operation (%) (3)
1914	25.5	59.2
1915	35.0	77.0
1916	46.3	94.3
1917	48.8	90.8
1918	48.2	84.6

Of this total production, foreign demands took

	Total Prod. (millions of tons)	Exports (000's of tons) (4)	%
1914	25.5	129.123	5.19%
1915	35.0	293.207	8.4%
1916	46.3	503.971	10.8%
1917	48.8	536.980	21.0%
1918	48.2	444.835	9.4%

(1) Steel Facts, February 1941 p.4-5
(2) Survey of Current Business May 30, 1940 p. 17
(3) Moody's Standard Trade and Securities Report 1940 P. ST 13.
(4) United States Department of Commerce - Survey of Current Business as of January 1, 1922 No. 6 p. 42 - 43.

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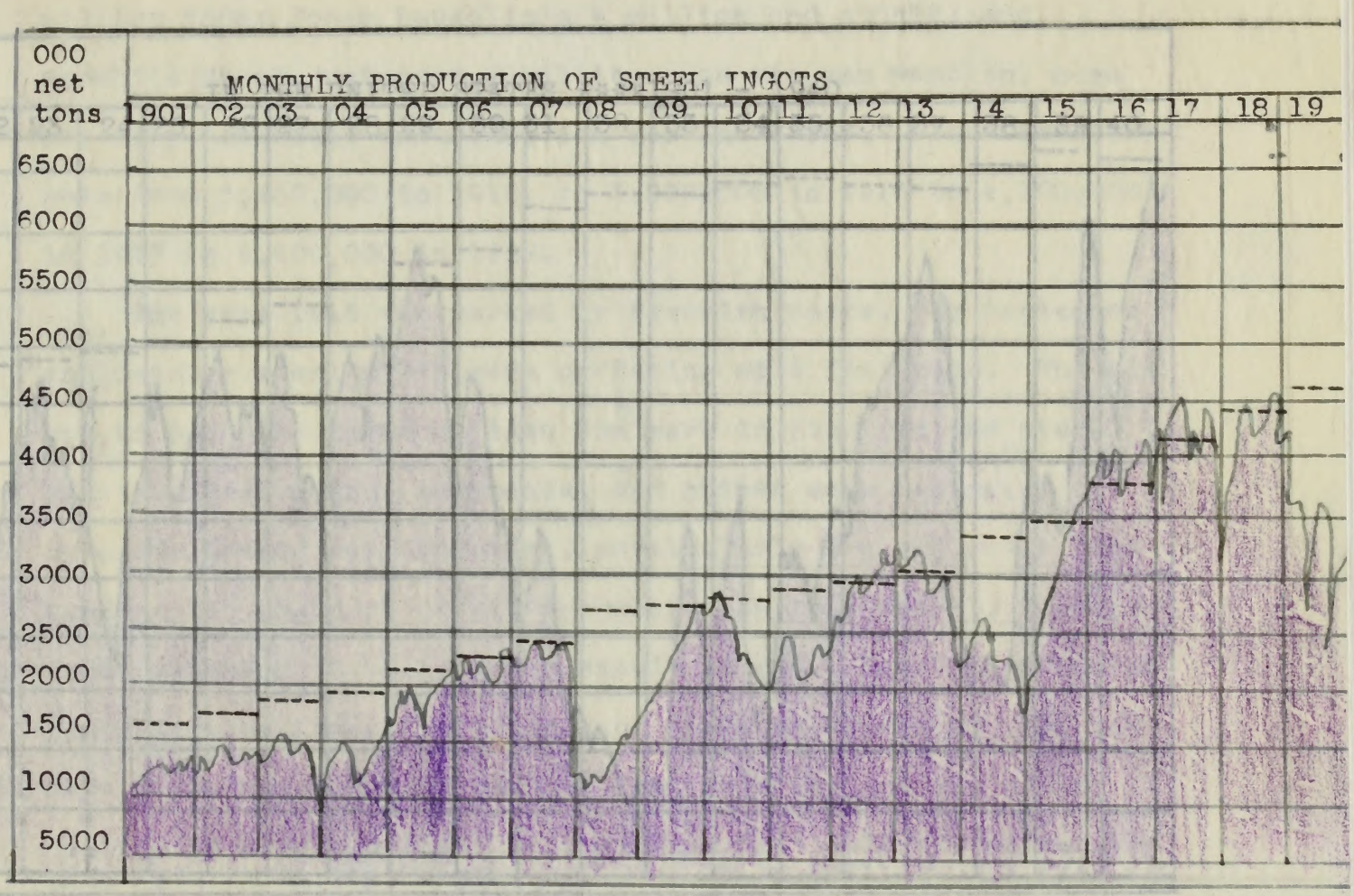

Note. 1901-26- Open hearth, bessemer, electric and crucible steel ingots. 1927 -date - Open hearth and bessemer steel ingots only.
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Sources. 1901 - 1916 - Estimates by Iron Age.
1927 - date - American Iron and Steel Institute Reports.

Capacity. 1901 - 1916 - Estimates by American Iron And Steel Institute and American Metal Market. 1917 - date - American Iron and Steel Institute Reports.

Key Production ~~~ Capacity ----

Taken from Steel Facts. February, 1941. No. 45. p. 4-5.

Note. 1901-25- Open hearth, bessemer, electric and crucible steel ingots. 1925 -date - Open hearth and bessemer steel ingots only.

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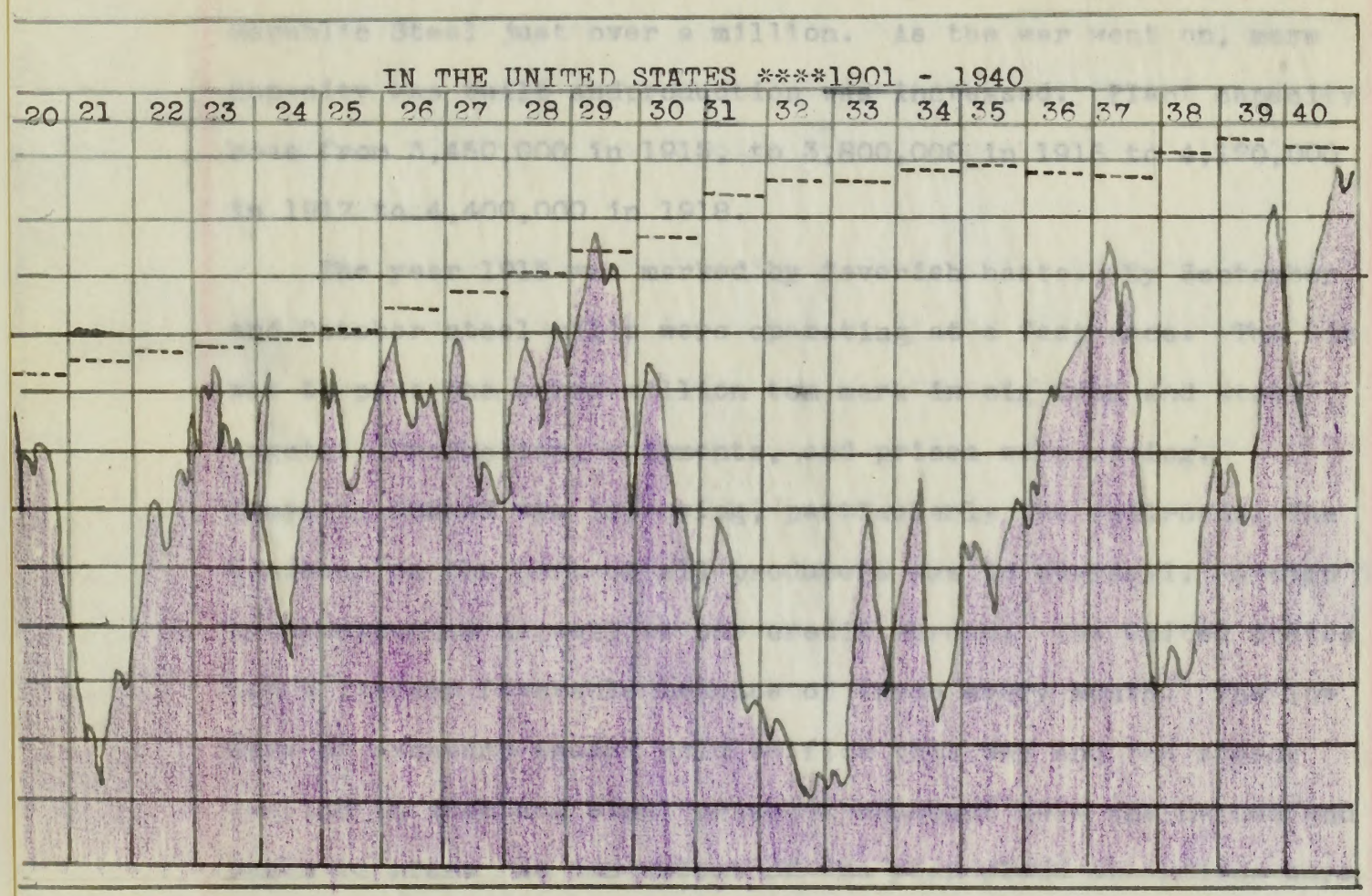
IN THE UNITED STATES ****1901 - 1940
20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

IN THE UNITED STATES ****1901 - 1940
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By August 1914 the United States Steel Production kept a rate of operation equal to 1,995,261 tons or 64,363 tons a day. This was a net increase of 1200 tons over the preceding month. Bethlehem's production for the same month was just below one million tons; Jones Laughlin's a million and a half; and Republic Steel just over a million. As the war went on, more capacity was built andproduction was increased. Plant capacity rose from 3,450,000 in 1915, to 3,800,000 in 1916 to 4,120,000 in 1917 to 4,400,000 in 1918.

The year 1915 was marked by feverish haste. By September and October steel mills were operating at a fast pace. The aim was to pass the three million ton mark in pig iron and steel ingots. Production, shipments, and prices were rising. Domestic demand was improving, particularly the railroads. The tendency on the part of all producers was to oversell. Foreign trade expanded as well as our credit abroad. The United States had a largeer favorable balance of trade every month. The low rate of exchange caused gold to flow this way and the steady decline in iron and steel prices throughout 1914 was halted and began to rise. At the outset of the year plant operations were between 40% to 50 % of capacity. On February 11, 1915 operations increased to 60% and by June, steel was at 80% of capacity.

Although the steel prosperity in 1915 was mainly caused by the war, it must be subdivided. The United States was receiving a larger merchandise trade balance. The country was

more prosperous and domestic customers were buying more freely. The war was giving us increased trades with the neutrals. We launched into a program of increased commodity exchange and trade relations with Latin America. Belligerents were buying foodstuffs, clothing, etc., here which caused expansion in their manufacture and a demand for steel in erecting new capacity. The foreign demand for ammunition increased the demand on steel mills and similarly the foreign demand for steel kept industry at top speed.

Since the United States Steel Corporation was not in the munitions business on a large scale, it got off to a slow start. The first foreign orders were for the trench barbed wire, and later for shrapnel, bars, explosive shells, guns and auto trucks. Russia was in need of locomotive and steel cars and rails. By the middle of 1915, United States Steel was operating at 90% of capacity and exporting 1/3 of her total production. Up to April 1, 1917, United States Steel supplied 6,000,000 tons for munitions.

In 1914 Schwab bought the Fore River shipbuilding plant and stood ready to furnish complete battleships at the outset of the war. Early in 1914, she took orders for several big guns for Germany and later for the Allies. As soon as Great Britain declared war on Germany, Lord Kechtner called Schwab and signed a contract for Bethlehem's full munitions supply. In two years Bethlehem became the world's biggest munitions producer and its shipbuilding plants turned out more tonnage

than all of Germany's yards. Because it was ruled illegal to build submarines, Bethlehem made parts and shipped them to Canada for assembly.(1) Schwab also bought the Pennsylvania Steel Company in 1916 with mills in Lebanon and Steelton (Harrisburg) and subsidized the Maryland Steel Company at Sparrow's Point near Baltimore. The Pennsylvania Steel Company doubled Bethlehem's capitalization and transformed it from a munitions and a shipbuilding firm into a general steel organization matching the United States Steel Corporation at nearly all points of manufacture.

Prices

Due to the increased demand prices rose. At first, there was a great degree of speculation in pig iron prices. Speculators hunted for orders and in March, 1914 booked heavy unfilled orders for the latter part of the year, buying steel at $11.50 a ton in Buffalo, New York and $9.23 a ton in Birmingham, Alabama to be sold at $13.00 and $14.00 later. They also bought large blocks to hold for the rise in prices. By October, 1914 the huge excess of demand over supply stimulated the offering of premiums over the regular prices. This situation became aggravated in November and December. An increase of 25¢ a ton in pig iron used to be considered an event, but when prices increased 75¢ and $1.00 a ton, everybody saw that the war spiral of prices was going into operation. England at first refused

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(1) Steel Dictator p.77-78

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(1) Steel Director p.77-78

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The year 1914 was one of low prices for all steels. In December of that year the market price of pig iron was $12.39 a gross ton; $30.70 a fross ton for finished steel; and $9.13 for steel scrap. In the following years, the demand taxed the existing capacity and prices rose. The speculative spiral was at its height in July 1917 when prices were

	$ per gross ton.	% gain over 1914
pig iron	$52.11	300%
finished steel	119.50	228%
scrap	37.21	310%

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Steel was experiencing a run away market. Prices advanced sharply and differed from day to day. Never before in the history of the country had steel enjoyed such a heavy demand. Steel was in its hey-day. Pig Iron prices in 1915 will illustrate the rapid increases experienced.

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July 28	$14.50 per ton
Aug. 18	15.00
Aug. 25	15.50
Sept. 8	16.00
Nov. 17	17.25
Dec. 1	18.25
Jan. 2,1916	20.00

Price Control

In April, 1917 when the United States entered the war, price controls were placed on 537 commodities - among these

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(1) Iron Age Sept. 10, 1914 p. 239 col. 2.
(2) Iron Age Sept. 2, 1915 p. 538 col. 1 + 2.

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Labor

Labor is a vital factor to the steel industry. Furnaces may be able to melt, mould, and shape steel, but men are required to operate the furnaces. The Steel Industry is the largest employer of all basic industries, consequently it has a great deal of power and responsibility for the way of life, security, and happiness of millions of Americans. The Labor

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(1) Poor's. Steel and Iron Survey 1940 p.32 - B.

policy of the industry as a whole has been one of shunning organized labor. The men are paid by the hour and have become accustomed to accepting a long twelve hour working day. The United States Steel Corporation has set the wage patterns for the entire industry. Its policy has been inflexible with no exceptions for any mills. The wages paid were less than those set by the union scale based on the statement that employees held steadier employment which compensated for the low wage rate, but equalized the annual wages with those of other industries. Adhereing strictly to an open shop, the Corporation has been termed a "Union wrecker".

Since the turn of the century, the labor movement has changed, steel towns changed, national and racial groups become diffused and the steel workers themselves changed, but the Corporation Labor Policy did not change.(1)

Criticisms of the Corporation's labor policy have revolved around the following parts.

1- depressing wages and lengthening hours

2- spying on workmen

3- debauching unions

4- corrupting union leaders

5- adhering to an open shop policy thereby menacing the establishment of labor organizations.

6- suppressing any measure of democracy, denying free speech, and the right of assembly to workers.(2)

(1) This is stated as the course of events before the N.R.A. code
(2) Fortune May 1936 p.134.

However, wages constitue approximately 1/3 of fixed costs in the industry. Of the items which vary with reverses in volume, pay rolls, goods and services purchased represent over 90% of the additional costs per ton.(1) In the last war, as production soared to high capacity operations, labor was working at least 12 hours a day and more often 16 and 20 hours. Time and a half for overtime was not instituted until October 1, 1918. Wage rates differ in each industry according to the type of work and the location of the industry. The only statistical figures available refering to wages in the last war period are a series of percentage increases and when they went into effect. In 1916 all wages were advanced 10%. Additional measures were as follows:

	% increase (2)	
Feb. 1, 1916	10	
May 1,1916	13.6	yearly incr. 43.6%
Dec. 15,1916	10	
May 1, 1917	9	
Oct. 1, 1917	10	yearly incr. 19.%
April 16, 1918	15	
Aug. 1,1918	10.5	yearly incr. 35.5%
Oct. 1, 1918	10	

(based on a ten hour day. At this time basic day changed to 8 hours and time and a half for overtime.)

Although these figures seem large, we must bear in mind that the costs of living had increased tremendously in this period which would alter the picture presented by these figures.

Strikes

Several times labor has attempted to enforce its demands

(1) U.S. Steel Corp. T N E C papers Vol. II p.55
(2) Daugherety, Carrol. Vol. I p.321.

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	% Increase (2)	
Feb. 1, 1918	10	
May 1,1918	15.6	Yearly Incr. 45.4%
Dec. 15,1918	10	
May 1, 1917	9	
Oct. 1, 1917	10	Yearly Incr. 19.8%
April 15, 1918	15	
Aug. 1,1918	10.5	Yearly Incr. 35.5%
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(1) U.S. Steel Corp. T N E C papers Vol. II p.855
(2) Daugherty, Carrol. Vol. I p.821.

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Taxes

Aside from the usual corporate and income tax, the steel industry was not affected by taxes in the last war until 1918 when the Excess Profits Tax went into effect. Taxation was no worry for steel producers. They were able and did reap big

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(1) Fortune May 1936 p. 160 col. 1 + 2

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(1) Fortune May 1934 p. 150 col. 1 & 2

gains from the war abroad. When the Excess Profits Tax went into effect, it established a legal tax base of from 20% to 60% of earnings above 9% invested capital plus a munitions tax of 12½% - later reduced to 10%. The United States Steel Corporation's taxes were

1916	$27,000,000.	
1917	252,000,000.	
1918	298,000,000.	(amounted to 150% of net earnings.)

As a rule it can be said that taxes for the industry in 1918 varied between 100% and 150% of net earnings.(1)

Investor's Status

Any investor to whom the safety of principle is the first objective coupled with some appreciation must take into consideration the type of industry, its good as well as its bad points, and the relation of the industry to the existing conditions. The Steel industry in the last war grew to tremendous heights and enjoyed rich earnings. This we know happened due to the big war demand for steel. Prices skyrocketed and wages increased, but nowhere near to the same degree as profits. To review the war period from the investor's viewpoint, one must go back to 1914. This year was not prosperous to the Industry because business was in a slump. One company after another had to forego the payment of dividends for the year. No improvements or replacements could be made because of a lack of funds. The general industrial scene was

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(1) Poors Steel and Iron Survey p. S2 - 8.

a drab-colored record of lapses deferred by a lack of business. In the beginning of 1914, stocks were low. Prices were low and mill orders were fair, and on the point of diminishing. The United States Steel Corporation barely earned the preferred dividend in the first quarter of the year and after paying the common stock dividend from surplus, the deficit for the year was $6,289,444.

Investment Status

The investment status prior to our entry into the war was as follows: United States Steel bond obligations were regarded as a high investment basis. The record of the company from 1901-1914 was successful even in the years of depression in the steel industry. The margin of safety above all interest, sinking fund, and depreciation requirements was very heavy. Preferred stocks in 1914 were regarded as a secure industrial investment, for during the ten year period 1904-1914 heavy amounts of earnings in general depreciation of property and in replacements were set aside creating a heavy amount of equity in back of the large preferred issue. At that time it was estimated that even under worse trade conditions the corporation would have no difficulty in reporting a surplus of many millions above its preferred dividend requirements. Common stock of the United States Steel Corporation had established itself even at that time as responsive to the fluctuating profits of the corporation -- and while no substantial dividend from 1901-1914 had been paid, it was regarded as a speculation rather than as

an investment.[1]

Bethlehem, on the other hand, from 1901-1914, made steady progress in strengthening its financial position as well as expanding its business. The surplus abover all fixed charge requirements increased rapidly since 1908. A great bulk of the surplus each year had been appropriated for depreciation and improvements, thus improving the position of the bond issues. The several issues of bonds were given a fair rating by Moody's. Dividends on the preferred issues had begun in 1909 and were not considered as a seasoned investment although it seemed likely that normal disbursements could be maintained under the then present normal trading conditions.[2] While other companies suffered from the depression, Bethlehem earned $9,600,000 in 1914.

In contrast to the two large heavy steel producers, Republic Steel in 1914 outshone the industry leaders. In the preceding years, the company showed marked fluctuations in its earning power, but since 1912 it recovered from its extreme reaction. Earnings in 1914 indicated that for the present time the preferred issue was secure. Since the bonds did not consume a heavy portion of the surplus, they were regarded as a substantial investment. The most interesting item in the comparison of the three companies is the margin of safety.[3]

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(1) Moody's Analysis of Investment 1914 p.946
(2) Ibid, p. 666
(3) Ibid, p. 770, 916 p. 465.

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(1) Moody's Analysis of Investment 1914 p.946
(2) Ibid, p. 806
(3) Ibid, p. 770, 918 & p. 466.

	1914
United States Steel	32%
Bethlehem	72%
Republic	55%

When the size of the three companies is considered, it is plain to see that Republic did better than the leaders -- and in the year 1914, Republic was by far the better speculation since in that year no absolute investment in steel was considered sound.

However, before and with our entry into war, the United States Steel Corporation dominated the industry mainly because of its size and leading position. In 1914 it received 70% of all war orders, but it must be remembered that war orders in this year were small and mainly consisted of barbed wire, shells and shot, tin, and plate steel. As the war continued and the steel industry expanded to take care of the increased demand, earnings became staggering. For example,

	United States Steel (1) net earned	Profits per ton
1914	71,663,615	$7.05
1915	130,396,012	9.97
1916	333,574,178	19.16
1917	295,292,188	17.15
1918	199,350,680	12.60

Earning exceeded all expectations in 1916 and became the year to own steel securities. All deferred dividends on cumulative dividend stocks were wiped out and every company declared extra distribution of profits. In 1916, earnings were four times those of 1914 due primarily to doubled capacity operations and a 59% increase in tonnage shipped. Gross

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(1) Poors Steel and Iron Survey p. S2-8.

business for the Corporation alone was over a billion dollars a year and in the final quarter of 1916 earnings were $106,000,000. As a result, extra dividends come fast. Basedon 1914 profits the United States Steel Corporation made an excess war profit of $661,000,000 for the years 1915-1918--a net of $533 for every German killed. The war was very profitable to the steel industry. By the end of the war assets increased by $771,000,000, and there was no more watered stock (1). In the two-year period 1916-1918 dividends alone amounted to $282,000,000 on 400,000,000 shares of preferred and common stock. Holders of $508,000,000 in common stock received $207,000,000--an income of 40% on stock. Bethlehem, on the other hand, earned $61,000,000 in 1916, nearly as much as that earned in the ten-year period from 1905-1915. In the next two years earnings rose to $54,000,000 in 1917 and $57,000,000 in 1918. (2)

Following is a statistical table illustrating earnings and the price range of Common stock. (3)

	Earnings				
	1914	1915	1916	1917	1918
U. S. Steel	71,663	130,396	333,574	295,292	199,350
Bethlehem	9,378	23,787	60,092	51,002	54,417
Republic	2,407	5,622	16,893	28,769	18,906
Inland	1,637	4,414	11,241	21,240	14,473

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1. Watered Stock of U. S. Steel Corporation explained in Appendix.
2. Steel Dictator. p. 85.
3. All figures from Moody's 1920 United States Steel. pp. 916-920. Bethlehem. pp. 465-471. Republic. pp.867-868. Inland. pp. 299-330.

Earnings on Stock (dollars)

	1914	1915	1916	1917	1918
United States St.					
1. Preferred	$6.52	21.05	75.37	62.24	38.17
2. Common	--	9.96	48.46	39.15	22.09
Bethlehem Steel					
1. 8% preferred *	--	--	--	92.20	53.10
2. 7% preferred	37.50	119.90	292.40	168.60	90.80
3. Common	32.60	113.10	286.30	40.50	21.00
Republic Steel					
1. Preferred	4.00	14.00	59.16	63.43	31.17
2. Common	--	--	37.84	51.89	22.22
Inland					
1. Common	14.00	38.00	105.00	42.00	21.00

*-8% preferred issues in 1917.

It can be said that the war period 1914-1915 was profitable to the steel industry and therefore to the investor. Dividend disbursements were liberal. For example:

1. United States Steel Corporation

Dec. 30, 1914	Declared dividend was	½ of 1%	
Dec. 30, 1915	"	"	1¼%
1916	"	"	5% regular; 3 3/4% extra
1917	"	"	5% " ; 12% "
1918	"	"	5% " ; 9% "
1913	"	"	5% " ; 1% "

2. Bethlehem

January 2, 1914	Declared dividend		5%
1915	"	"	9%
1916	"	"	30%
1917	"	"	19%
1918	"	"	10%
1919	"	"	5% regular and 5% extra (1)

1. Moody's 1920 p. 916-920 and p. 468-469.

Chapter III

Intervening Period

Most wars are followed by a sort of feverish activity and expansion usually culminating in an inflation and sudden collapse. The magnitude of the war determines largely the extent and duration of such a movement. A large war is usually so completely destructive that the tendency towards expansion cannot assert itself in too great a movement. A period of recuperation immediately follows a war and the steel industry has proven this. The excesses of the war boom had to be corrected. Prices in general rose to such high levels that it was cheaper to import goods and purchase those. Gold was flowing out of the country at an unprecedented rate. The rise in prices increased the money in circulation, made necessary larger reserves of gold which in turn necessitated the raising of the rediscount rate to keep gold in the country. Rising prices stimulated excessive inventory buying. Tossing their goods on the market halted production. As a result, prices fell immediately and spectacularly. Once inventories were liquidated, production was resumed and came back to normal again.

Problem of Capacity

The steel industry has felt the effects of a post war period. Increased capacity and stepped up production to meet war needs had to decline when the demand no longer existed.

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There were few alternatives which the industry could take - either to abandon the excess capacity or to turn it into other types of production. Abandoning capacity was out of the question for it represented huge investments. Therefore, the second alternative was chosen. The industry turned to stimulate domestic consumption. Foreign demands of American Steel helped to keep the industry at fairly high levels in 1920. However,as the countries abroad got back on their feet and resumed their industries, exports of steel diminished.

At first the building and construction and railroad industries kept steel at a fairly good level of operation. However, they declined in the twenties and left the steel industry supplying only the smaller outlets. The one saving factor of the steel industry in the post war period was the automobile industry. Its tremendous expansion in the twenties helped to bolster steel. There was, however, one technicality and that was the need for light steel in automobile production, whereas most of the existing plant capacity was geared for heavy steel production. There was only one thing to do and thatwas to create light steel capacity. In the 1920's this is the change taking place.

Moreover, technicians and engineers now having more time discovered new methods of efficient production. This necessitated the abandoning of some capacity and we find that pig iron capacity declined in the period 1924-1929. Some furnaces were scrapped, others were left idle and labeled out of date.

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The greatest contribution engineers have made has been the discovery of a way to use more steel scrap and less iron ore in production and the use of a continuous strip mill. This has resulted in a prolonged life for the mines as well as a cheaper product.

The heavy steel producers, United States Steel, and Bethlehem found themselves in a difficult position during the depression markets. Being geared to heavy steel production, they found themselves on the outside as the automobiles, airplanes, dirigibles, machine and heat resisting machinery found increased uses for the special steels. In this period, the largest portion of the steel market was seeking the light and special steels.

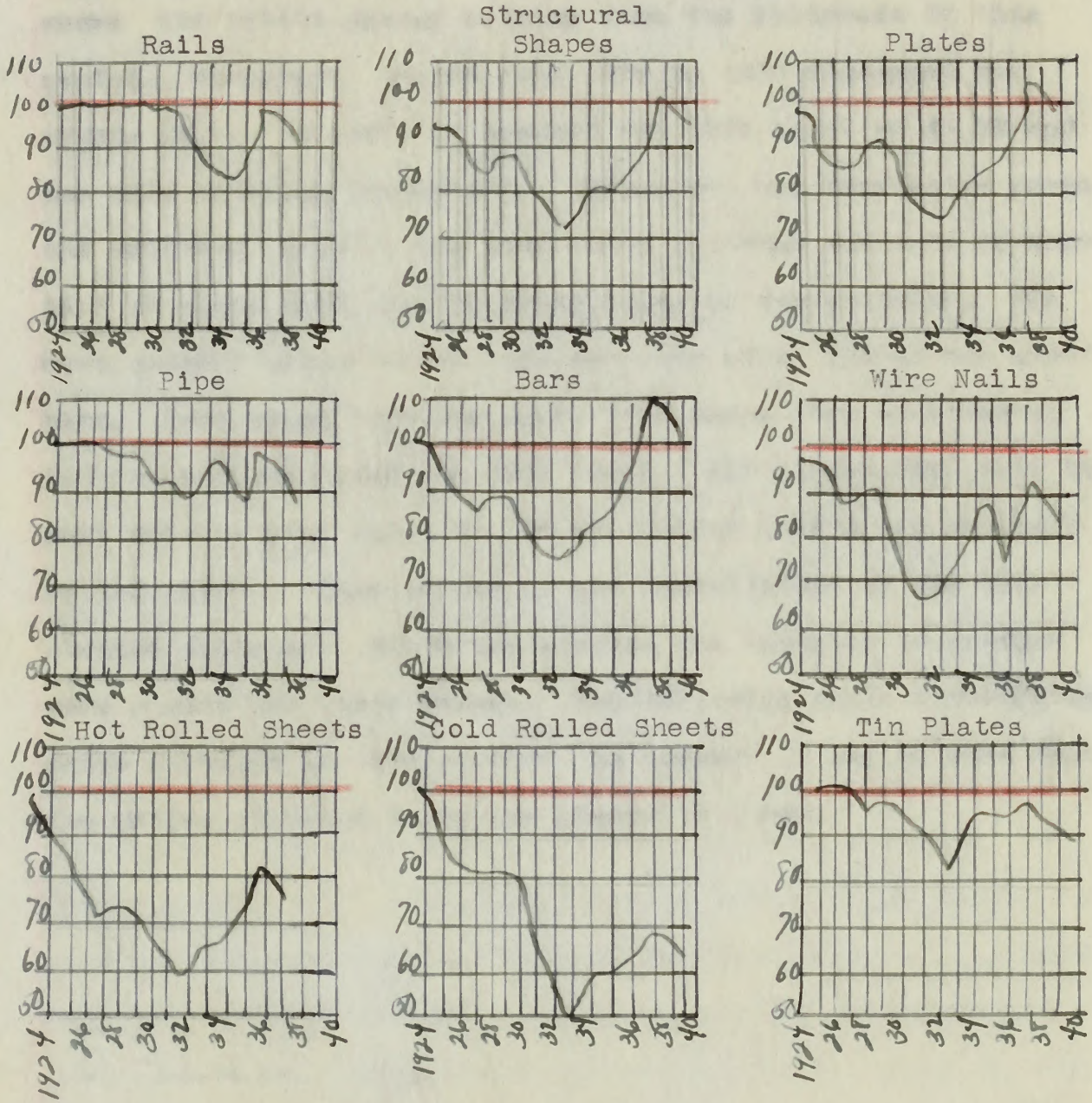
Prices

A considerable felxibility exists in steel prices. Not only do steel prices fluctuate but, also, prices of different steel products fluctuate in varying degree and direction. In 1924 prices of all steel products were considered as being normal. In that year there were,

	Price in 1924 (1)	
1. Rails	$43.00	per gross lot
2. Structural Shapes	2.19	per lb.
3. Plates	2.12	" "
4. Standard Pipe	70.30	" net ton
5. Bars	2.20	" lb.
6. Wire Nails	2.89	" keg
7. Hot Rolled Sheet	2.79	" lb.
8. Cold " "	5.00	" "
9. Tin Plate	5.50	" hose box

(1) As reported by Iron Age U.S.Steel Corp. TNEC Papers Vol. II p.76.

Average Yearly Base Prices of Principal Steel Products
Reported by Iron Age 1924 - 100



Source: After a chart in United States Steel Corporation
T. N. E. C. Papers. Vol. II p. 77

Average Yearly Base Prices of Principal Steel Products
Reported by Iron Age 1924 - 100

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From 1924 to 1940 - for eight years - rails were $43.00 per gross ton when they declined to a low of $36.37 in 1934. Since that year they have fluctuated around $40.00 a gross ton. This shows the little demand arising from the Railroads in this period. Structural shapes from 1924 to 1937 zigzagged but always fell. In 1937, it reached the 1924 level of $2.19 and has only slightly fallen off. Throughout the depression years, the building industry has been inthe doldrums and only recently, that is since 1937, has it shown signs of any activity. The most notable prices which rose were the steel plates and steel bars. Both swung down low until 1936 where they received an impetus and surpassed the 1924 level. All others fell with the most notable drop being in the hot rolled sheets and the cold rolled sheets. This is due to the installation of the continuous strip mill which has enabled the industry to produce more sheets and lower prices. The following chart illustrates price behavior in this period. In summary it may be said that the prices of steel today are generally lower.

Labor

In 1924, Gary abolished the twelve hour day and many other companies followed suit. Nevertheless, organized labor was still not recognized. "Up until the depression, the Corporation raised wages eighteen times -- setting levels for the industry and taking the lead in reducing them four times. The wage policy suggests that the Corporation is neither backward nor progressive.....in relation to the national industrial scene it has simply been negative."(1) The labor policy of the Steel industry has been to maintain their own labor unions and an Open Shop until 1937 when the Congress of Industrial Organizations and Labor signed 514 steel manufacurers, fabricators, and processing firms to a contract. A few companies held out, namely, Bethlehem, Republic, Inland, and Youngstown Steel and Tube and they had strikes.

The Industry is now largely unionized and most units are members of the Congress of Industrial Workers. The attitude of the National Labor Relations Board enabled the C.I.O to dominate most units. It has disestablished company unions and ordered employees to choose one or the other. It also ordered the reinstatement of strikers and taken other action regarded as high handed and dictatorial. With power in its bonds for the first time the National Labor Relations Board went too far and gained the ill favor of the C.I.O and the A.F. of L. Payrolls usually eat up approximately 40% of every sales dollar in the

(1) Fortune May 1936 p. 141 col. 3.

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In 1924, Gary abolished the twelve hour day and many other companies followed suit. Nevertheless, organized labor was still not recognized. "Up until the depression, the Corporation raised wages eighteen times -- setting levels for the industry and twice the lead in reducing them four times. The wage policy suggests that the Corporation is neither backward nor progressive.....in relation to the national industrial scene it has simply been reactive." (1) The labor policy of the Steel Industry has been to maintain their own labor unions and an Open Shop until 1937 when the Congress of Industrial Organizations and Labor signed 514 steel manufacturers, fabricators, and processing firms to a contract. A few companies held out, namely, Bethlehem, Republic, Inland, and Youngstown Steel and Tube and they had strikes.

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(1) Fortune May 1936 p. 141 col. 3.

industry. On the whole since 1918 wages have been steadily on the increase. (See chart - next page)

Management

Management in the last decade has been progressive in handling the problems of rehabilitation, higher wages, taxes, indebtedness, labor and prices. Since 1929, 3,073,000 net tons of steel furnace capacity has been abandoned and replaced with a capacity of 8,658,000 net tons. Modernization of furnaces increased total capacity by 4,730,000 net tons. At the end of 1939, net ingot capacity for the United States Steel, for example, was 81,619,000 net tons - 14% above 1929. From 1935-1939 the industry spent $937,000,000., and $146,000,000. (estimated) in 1940 to improve mills. The first continuous rolling mill, the height of steel efficiency operation, was established in 1926. By 1939 there were 27 in operation resulting in an improved steel output per man. In 1939, the average output was 120 pounds per man compared with 112 in 1937 and 105 in 1936.

Total indebtedness of the industry has shrunk as a result of refinancing preferred issues and substituting lower dividend preferreds. It is estimated that this debt reduction cut interest charges from $68,000,000. to $36,000,000. annually. Total indebtedness for United States Steel in 1925 was 1.3 billion dollars. By 1938, it was reduced to 953 millions and by 1936 to 246 millions. The last decade has been exceedingly difficult for the steel industry due to unfavorable economic

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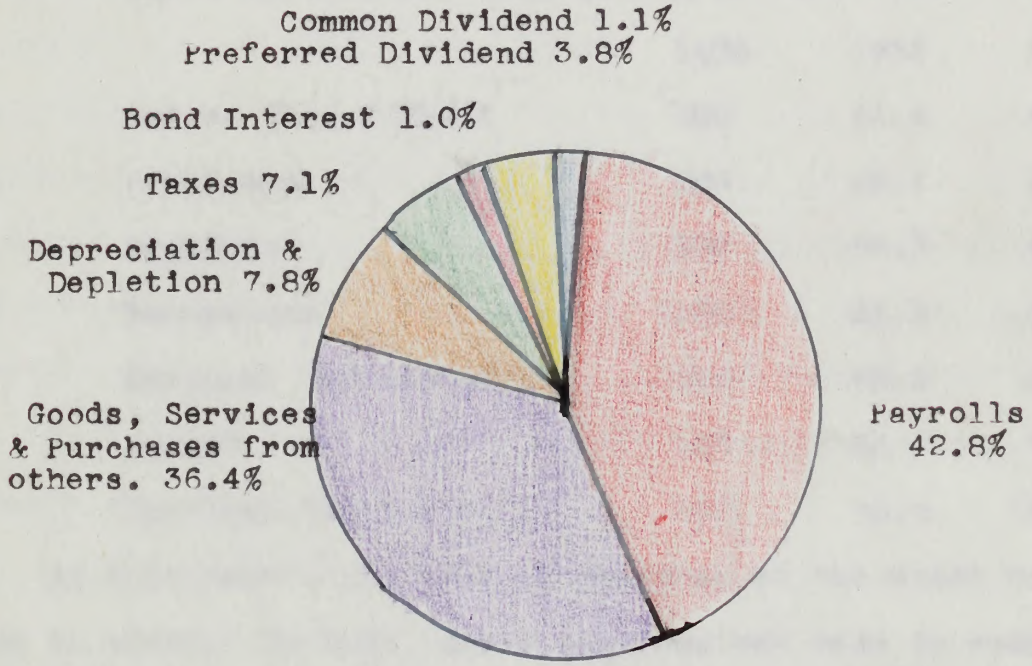
DISTRIBUTION OF THE SALES DOLLAR
United States Steel Corp.
1929-1938



Source. United States Steel Corporation. T.N.E.C. Papers. Volume II. p. 25.

DISTRIBUTION OF THE SALES DOLLAR
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Volume II. p. 25.

developments, rising taxes, increased efficiency, labor costs which were partly offset by reduced fixed charges, improved products, and the maintenance of operations at any levels regardless of how low.(1)

An analysis of earning power, sales, and costs indicate the position of the different companies.

Sales in 1933 and 1934 as a % of 1930 100(2)

	1930	1933	1934
United States Steel	100	44.4	50.1
Bethlehem	100	46.4	65.0
Republic	100	55.2	67.0
Youngstown	100	44.5	56.9
National (estimated)	100	83.3	104.5
Inland	100	53.2	78.1
American Rolling Mill	100	78.0	101.6

In this chart, the crucial weakness of the Steel Corporation is shown. In 1934, great progress was made in reducing costs. On 5,805,000 tons in 1934, the operating profit was $4.65 a ton. With this big improvement over 1933, the year 1934 has a worse showing. All of which means that a large per cent of the dollar received leaks away in costs which include plant operations as well as management.

The United States Steel Corporation is in the heavy steel business, while the market for this period was for light steel. Railroads and construction builders, the heavy steel users, were also in the doldrums while the automobile indusrty, a

(1) Fortune May 1936 p. 166
(2) Ibid. p. 167-169

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Sales in 1933 and 1934 as a % of 1930 100 (2)

	1930	1933	1934
United States Steel	100	44.4	50.1
Bethlehem	100	46.4	65.0
Republic	100	55.2	87.0
Youngstown	100	44.8	86.9
National (estimated)	100	85.8	104.8
Inland	100	83.2	98.1
American Rolling Mill	100	78.0	101.8

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(1) Fortune May 1934 p. 182
(2) Ibid. p. 187-189

a light steel user. was going along very nicely. However, the United States Steel Corporation is not overloaded with heavy steel capacity in comparison with its competitors, but since the Corporation is so big, it still has a sizeable amount of capacity in heavy steel.

United States Steel	55% of its finishing capacity in heavy products.
Bethlehem	81%
Republic	61%
National	9%
Inland	59%

National has 66% ofits capacity in light steel and 9% in rails and structure shapes which explains its good showing in the above table. The light capacity of United States Steel is mostly in products like pipes whose market during the depression greatly contrasted.

Operating Profits before depreciation and depletion as a % of each year's sales. (1)

	1930	1933	1934
United States Steel	12.9	3.6	6.5
Bethlehem	15.2	8.0	11.1
Republic	5.1	8.7	8.5
Youngstown	14.7	9.0	11.6
National	17.6	13.4	16.5
Inland	20.5	16.6	23.3
American Rolling Mill	6.2	14.8	17.3

In summary it may be said that the position of the United

(1) Fortune May 1936 p.167-169.

operating profits before depreciation and depletion as a % of each year's sales.

(1)

	1930	1933	1934
United States Steel	15.9	3.8	6.8
Bethlehem	15.2	8.0	11.1
Republic	5.1	8.7	8.5
Youngstown	14.7	9.0	11.6
National	17.8	13.4	16.8
Inland	20.5	16.6	23.3
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(1) Fortune May 1935 p.127-130.

States Steel Corporation has not passed the crucial stage. Losses have slightly impaired the financial condition. Earnings in 1929 outweighed the sum of losses up to 1929. In short, there is need for a change. The Corporation cannot make money for its stockholders nor can it pay good wages to its employees. It will not produce steel cheaply. It earned 12% in the first ten years of its life and 2.8% in the last. Wall Street in 1935 and 1936 had a low opinion of United States Steel. The Corporation is in desperate need for a change, but due to its tremendous size and unwieldly bulk any forthcoming change will be slow. Bethlehem in 1935 replaced United States Steel as a stock market quotations of United States Steel for the first time since Bethlehem soared to 700 during the war. Inland steel, lightly capitalized and more flexible grew strong during the depression markets and National Steel produced an amazing sales Volume and good earnings from 1932-1935.

Earnings

The large earnings accumulated in the war years were not invested but kept in liquid form swelling working capital and fortifying against a possible depression. United States Steel Corporation earned in six years a surplus, after dividends, of $473,250,419 -- adding $93.10 a share to the value behind common. Of this surplus, $318,423,519 was used to increase working capital, $72,290,329 to reduce current liabilities and $34,527,395 was added to the sinking fund reserve. Additions to the property account amounted to $148,904,616.

Bethlehem incurred heavy expenses for new construction but this was financed by the sale of securities. Surplus profits, after dividends, amounted to $96,267,649 or $160.80 a share. $65,388,191 was added to the working capital while $162,331,783 was added to the property account against this increased capital liability. $153,429,912 of this amount was financed by the sale of securities.

Republic Steel used slightly more than half of its $30,826,281 surplus earnings ($102.75 a share) or $15,576,791 in plant construction and expansion. $14,841,516 was added to the working capital and $837,158 to reduce capital liabilities.

Comparisons of working capital show that United States Steel Corporation added to cash and security holdings from 1915-1920 the huge sum of $210,905,989 inventories increased by practically the same figure as inventories -- $103,444,385. Bethlehem made larger expenditures than any other company -- a great deal of which was the result of the war. Expenses and acquisitions amounted to $275,000,000. Surplus available for common dividends after the six year period ending December 21, 1920 amounted to $201.00 a share but this was not all paid out for $106.80 a share was retained after common dividends were paid.

Steel shares had great values added after this six year period. It was assumed that after the war the companies would invest their surplus earnings in the non-productive plants. This was not true in all instances. The United States Steel

Corporation, Republic, Lockaro, and Midvale added large sums to actual cash value as well as spending millions for new construction and acquisitions as Bethlehem did. The United States Steel Corporation spent nearly $500,000,000 for new construction and acquisitions which was equal to an average of $97.00 a share on common stock. The surplus after preferred dividends in this same period was equal to an average of $144.05 a share on common stock and after the common dividend was paid, a balance equal to $93.60 a share on common was retained. Republic Steel from 1914-1920 earned $126.44 a share for its common stock but retained $102.75 a share in the company. Many millions were spent for new construction and acquisitions largely connected with the diversification of its products which in later years added greatly to earning power.(1)

Security Status

The depression years saw the industry trying to acclimate itself to business conditions. Heavy steel production only rose as general business rose. The production picture of the industry may be said to be identical with that of the business behavior in the country. After the short depression of 1924, steel securities also rose to unprecedented heights in 1929 only to fall to the bottom in 1932-3. The following charts showing net income and monthly price range of common stocks shows the picture. However, two definite trends are obvious, namely, the position of the light and alloy steels in this

(1) Figures from Barrins may 9, 1921 p.5

period and management. These companies not burdened with heavy costs as United States, for example, were more flexible. In the crash, of 1929, they also fell but recovered more quickly. This was partly due to their financial structure as well as to the increasing market for specialized steels. National Steel is the perfect example. The company had everything for a crisis market - small emphasis on rails, tubes, and structural needs, a heavy emphasism on steel sheets for the automobile market and tin plate for the humble, yet big, steel consumer, the can. It had the only mill in Detroit tailored to meet the needs of the automobile industry. Here it stepped away from the precedent. Instead of having consumers come to it, National Steel went to the consumer, thereby eliminating the location factor in costs. National Steel rose from sixth position in profits in 1929 to fourth in 1930 and stood alone in solitary grandeur asthe only profit maker of the lot from 1932-1933.(1)

The United States Steel Corporation made a poor showing during the depression. One of its main troubles is the enourmous plant investment required and small operations make for unprofitable years. It costs the same amount of money to run a mill at 30% capacity as at 100%. Furthermmre, sales possibilities are limited in poor times because steel forms a small part of the costs of the industries that use it do that a reduction in price would stimulate their demand only

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(1) Steel Dictator p. 326.

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The United States Steel Corporation made a poor showing during the depression. One of its main troubles is the enormous plant investment required and small operations make for unprofitable years. It costs the same amount of money to run a mill at 50% capacity as at 100%. Furthermore, sales possibilities are limited in poor times because steel forms a small part of the costs of the industries that use it so that a reduction in price would stimulate their demand only

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(1) Steel Dictator p. 328.

moderately. Steel cannot prosper unless other industries are prospering. In 1934 the plant to sales ratio for United States Steel was 2.75 and in the first nine months of 1935 earnings looked sick in comparison to those of other companies.

Earnings Before Interest -- first nine months of 1935. (1)
(00's)

National Steel	10,106
Inland	8,005
Republic	5,671
Bethlehem	7,068
Youngstown	3,363
Jones-Laughlin D	d 299
United States Steel D	d 507

For the full year of 1935 the corporation earned $5,500,000 for which the corporation railroads contributed a net of $6,000,000 (estimated) and the Corporation itself was at a higher rate of capacity than its competitors. All of which proves that the Corporation itself lost a tremendous amount of money and even favorable railroad earnings could not lift it out of the red. (2)

The record of the steelindustry in comparison with others which have had to cope with the problem of bigness does not stand out too favorably over six years of prosperity and five years of depression (1925-1936)

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Net Earnings before Interest of Various Corporations Expressed as % of the sum of funded debt, capital Stock and surplus at the end of respective years. (1)

	Total 1925-30	Total 1931-35	Total 11 years	Average 11 years
United States Steel	37.5	d. 5.9	33.1	3.0
General Motors	154.7	17.8	195.1	17.1
Allied Chemical and Dye	66.6	38.3	105.5	9.6
General Electric	93.2	32.4	128.1	16.6
Kennecott Copper	70.3	5.2	74.2	6.8
Dupont	82.8	43.0	121.7	11.6
American Can	70.4	46.2	116.4	10.6
American Radiator	82.8	1.2	79.6	7.2
International Harvester	58.5	1.5	57.6	5.2
Inland Steel	59.3	19.8	97.2	7.0
Youngstown Sheet and Tube	48.3	d.4.3	43.8	4.0
Bethlehem	31.3	1.6	37.5	3.4
American Rolling Mill	40.4	10.0	44.9	4.1

It must be remembered that General Electric has very good patents and that the automobile boom began in 1910 and was still going on. This table proves that it is more difficult to make money in steel than it is in the automobile industry. Since raw steel is 1½ cents a pound, it is a commodity whose sales cannot be increased by stream-lining. Moreover, Steel in this period is a mature industry. Its boom days were in 1890-1910 period and its curve has flattened out since. Even in the days of Coolidge prosperity the industry earned only 6.4% on its investment.

The following tables present a picture of steel earnings in the last two years, 1939 and 1940. (2)

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(1) After a table in Fortune, May 1936 p.164

(2) Tables from Poors Steel and Industry Basic Survey1940 p.8

Net Earnings before Interest of Various Corporations
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	Total 1928-30	Total 1931-35	Total 11 years	Average 11 years
United States Steel	37.8	d. 5.9	33.1	3.0
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Allied Chemical and Dye	66.6	38.3	105.5	9.6
General Electric	93.2	32.4	128.1	12.6
Kennecott Copper	70.3	5.2	74.2	6.8
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American Can	70.4	46.2	116.4	10.6
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Chapter IV

Present War and Outlook.

Warfare today is not trench warfare and an army marching on its stomach; instead it is a mechanized war of airplanes, tractors, tanks, trucks, and motorized equipment coupled with a quickened tempo for replacement. Since Hitler's march caught the democracies unprepared, the industries, especially the steel industry, are at a feverish pace. From September, 1939, to August, 1940, operations averaged 91.3% of capacity and the actual output was 63,100,000 net tons. Production of pig iron and steel ingots in the last four months of 1937 was equal to 44% of the total output for the year. The restricted output during the earlier months of 1939 prevent the total for the year from exceeding that of 1937.

Year	Output (net tons)	% of capacity
1939	52,799,000	65
1937	56,637,000	72
1929	63,205,000	89

The German blitzkrieg on Europe's mainland is responsible for our National Defense Program and war-geared economy. In the next five to six years, the cost of this program is estimated to be in the vicinity of $40,000,000,000. to supply us with a two ocean navy, an expanded air force, a mechanized army, and an increase in the number of men in our armed forces. In this war, Steel is the most important war material and the industry is already getting a huge steady flow of orders,

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1. Poors. Steel and Iron Industry Survey pp. 52-3

Chapter IV

Present War and Outlook.

although they will be but a small percentage of the total output. The navy will require at least a billion and a half tons of steel, road building will consume another million tons and, in addition, there will be demands for shell, sheet steel for tanks, guns, ammunitions, and other raw material. Chairman Ryerson of the Board of Directors of Inland Steel estimated that domestic demand will not exceed from "6-7 million tons in a peak year and might be as low as 5 million tons in 1942."[1] Nevertheless, this is still a lot of steel. Defense contracts awarded since June 30, 1940 amounted to

United States Steel	$50,000,000.[2]
Bethlehem	6,500,000.
Republic	154,362.
Inland	39,580.

Output for the year 1940 reached 66,993,000 net tons with an operating capacity averaging 82% for the year. This record surpassed that of 1929 and established a new time high. This output was made possible mainly by a steady expansion in facilities during the last 30 years (except for three years 1932-35). Ingot steel and steel for castings also established a new high with record output reaching 84,152,000 net tons at the end of 1940. Pig iron output expanded to 46,816,000 tons. Total ore shipped abroad rose to 74,969,000 tons. The intergrated steel companies which own their resources of raw materials now possess an advantage which was a handicap in the depression period. It must be remembered that in the steel industry high

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1. Poors. Steel and Iron Industry Survey p/ s 2-5
2. That is, since June 30 to November 10, 1940. Barron's Nov. 10, 1940. p. 3.

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levels of operation reduce unit costs as a whole and frequently more than offset the higher prices of raw materials. However, any bottleneck in coke or other raw materials places hardship on the unintergrated units.

Prices

The price structure is greatly improved. With all plants operating at capacity, there are no more economic concessions. In 1940, steel scrap set a new high. From the low of $16.75, in April it rose to $23.00 and $24.25 a ton. Pig iron, on the other hand, changed relatively little in the same period. However, the threat of serious price rises and inflation brought about price restriction by the Price Stabalization Division of the Office of Production Management. In January, 1941, Commissioner Leon Henderson placed a tentative ceiling of $20.00 a ton for No. 1 heavy melting steel at Pittsburgh. This is $2.00 below the levels already reached at the end of 1940. Coke, too, by early 1941 rose $1.00 per ton. This rise increased the costs of pig iron producers. However, the reduction on scrap and the increase in pig iron tend to offset one another, so that costs have not materially risen.

Many people are asking why is steel scrap playing so large a part in present steel production and why the price of pig iron has been pushed down.

The answer is the more scrap used, the less money is invested in coal mines, ore reserves, and blast furnaces. These expenses are borne by the intergrated user making pig iron, which comes back to the scrap user as iron and steel

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scrap. Since location to coal and ore is not a predominate factor to the scrap user, he can set up buildings anywhere--next to manufacturing centers whose factories will sell him cheap scrap. Examples of such concerns are the Continental Steel of Kokomo, Indiana, and Keystone Steel and The Wire Company of Peoria, Illinois.

Apparently, the percentage of pig iron and scrap consumed will not vary in their ratio to each other more than moderately. The real reason for the increased use of scrap is that its use does prolong the life of ore deposits and necessitates less fuel in manufacture. The potential supply of scrap is great and tends to increase. Its widespread availability has made possible many small steel companies. In fact, many steel makers look upon scrap iron as a natural resource.

The demand for scrap fluctuates more widely than that for pig iron. Intergrated companies, in times of curtailed operations, are forced to consume a larger proportion of the pig iron in order to keep the blast furnaces going. When times are better they resort to pig iron and steel scrap. Consequently, scrap prices are more sensitive to change in steel production.

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1. Poors. Steel and Iron Industry Survey, 1940 p. S2-14-15
2. Ibid. P. S2-18
3. Fortune. March, 1936. p. 176-8

Iron Age Composite Index of Steel Scrap Prices [1]

Year	Dollars per gross ton	
June, 1936	$13	
Spring, 1937	21	
June, 1938	11	(slump in domestic operations and a subsidence of export demand.)
early Aug., 1938	15	
Spring, 1939	15	
Feb., 1940	16	

The average price of steel scrap in Pittsburgh, Chicago, and Philadelphia in September, 1940, was $20.00 per gross ton. The following table will further point out the extreme fluctuations of scrap in comparison to the other steel products:

Average Monthly Prices of Pig Iron, Cast Iron Pipe, Finished Steel and Steel Scrap, 1939 (2)

1939	Pig Iron	Cast Iron Pipe	Finished Steel	Steel Scrap
Jan.	20.61	49.--	2.29	14.94
Feb.	20.61	49.--	2.29	15.01
Mar.	20.61	49.--	2.29	15.20
April	20.61	49.--	2.29	14.77
May	20.61	49.--	2.26	14.17
June	20.61	49.--	2.24	14.71
July	20.61	49.--	2.24	14.92
Aug.	20.61	49.--	2.24	15.43
Sept.	20.61	49.--	2.24	18.32
Oct.	21.61	52.20	2.24	19.66
Nov.	22.61	52.20	2.26	19.66
Dec.	22.61	52.20	2.26	18.05
Average	21.19	48.40	2.26	16.39

Labor

On January 1, 1939, the United States Department of Labor

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1. Poors. Industry Studies, 1940 p. S2-18, S2-19
2. Pig Iron is $ per gross lb; cast iron is $ per ton @ New York of 6" and larger pipe; Finished steel is cents per lb; and Scrap is $ per gross ton at Pittsburgh, Chicago, and Philadelphia. Survey of Current Business, 1940. p. 9

Iron Age Composite Index of Steel Scrap Prices [1]

Year	Dollars per gross ton
June, 1936	$17
Spring, 1937	21
June, 1938	11 (slump in domestic operations and a subsidence of export demand.)
early Aug., 1938	15
Spring, 1939	15
Feb., 1940	16

The average price of steel scrap in Pittsburgh, Chicago, and Philadelphia in September, 1940, was $20.00 per gross ton. The following table will further point out the extreme fluctuations of scrap in comparison to the other steel products:

Average Monthly Prices of Pig Iron, Cast Iron Pipe, Finished Steel and Steel Scrap, 1939 (2)

1939	Pig Iron	Cast Iron Pipe	Finished Steel	Steel Scrap
Jan.	$20.61	$49.--	$2.29	$14.94
Feb.	20.61	49.--	2.29	15.01
Mar.	20.61	49.--	2.29	15.20
April	20.61	49.--	2.29	14.77
May	20.61	49.--	2.26	14.17
June	20.61	49.--	2.24	14.71
July	20.61	49.--	2.24	14.32
Aug.	20.61	49.--	2.24	15.43
Sept.	20.61	49.--	2.24	16.32
Oct.	21.61	50.20	2.24	19.66
Nov.	22.61	52.20	2.26	19.66
Dec.	22.61	52.20	2.26	16.03
Average	21.19	48.40	2.25	16.39

Labor

On January 1, 1939, the United States Department of Labor

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1. Foote. Industry Studies. 1940 p. 52-18. 52-15
2. Pig Iron is $ per gross ton; cast iron is $ per ton $ New York of 6" and larger pipe; finished steel is cents per lb; and Scrap is $ per gross ton at Pittsburgh, Chicago, and Philadelphia. Survey of Current Business, 1940. p. 9

prescribed minimum hourly wage rates of $0.62½ an hour for the bulk of the industry. The range was from $0.62½ in the Central and New England States to $0.45 in the South East and South Central States. The Nation was divided into six zones. In zones one and three, $0162½ - having 92% of steel ingot capacity; $.60 in zones five and six (Far West) with 2.5% of ingot capacity; $.58½ in zone four (the 7 states west of Illinois and Wisconsin) with 21% of ingot capacity and $.45 in the South (zone two) where there is 3.4% ingot capacity. The Walsh-Healy Act authorized that these designated minimums must be paid by companies bidding for government contracts. The increased business made it advisable for the industry to comply with these rates, and by August, 1941, practically the entire industry was paying these minimums. In 1939, the steel wage was about 30% higher than that of 1929. Widespread plant expansion, increased operating efficiency, and high labor costs were offset by more sales, but lower profit margins.[1]

The seriousness of the National Defense Program should necessitate no labor disturbances. Wage earners have been getting more than the minimum amount and even more than that paid in 1929.

Year	Price Paid per Hour.
Aug., 1940	85.1 cents
1939	84.2
1929	65.4

1. Poors. Steel and Iron Industry Survey. p. S2-5
2. Ibid. p. S2-15-17

But there have been strikes and it does not seem that they will be avoided unless the government takes an active hand in the matter. This it seems reluctant to do. Arguments can be given on both sides of the question. On the one hand labor has suffered in the steel industry for a long period of time. It has become restless and through organized units has learned to strike at crucial moments. Industry today is war-minded, but labor is not. The steel problem is twofold--to turn goods out fast enough - and to turn them out on time. Industry has the long point of view in mind, which is to supply England with what she needs and strengthen our defense; whereas, labor has the short point of view in mind - that of immediate satisfaction. It is not thinking in terms of the ultimate. In our present situation, all the evils of society cannot be rectified immediately. They take time. Therefore, this surge to amend the evils of the capitalistic system immediately, only produces chaos and destruction. If production is our aim today, then let us produce under the system which can. If social readjustment is our immediate goal, then let us have social reform. The Two as they exist today cannot be combined.

Taxes

In addition to prices and labor costs, taxes will affect the operating costs of the steel industry. In 1940, although most concerns did well, taxes weighed heavily. The increased corporate tax of 20.9% and the Excess Profits of 24% of the four-year base period plus a steeply graduated tax ranging from 24%-50% on earnings in excess of the basic allowance will cut

into the steel industry earnings as the defense program and supplying Great Britain gain in momentum.

Growth companies will be severely hit by the new tax, since the average earnings during the 1936-1939 base period are below their current performances. The excess profits tax has placed a damper on expansion since higher earnings will be substantially taxed during the present period of record activity. Steel is expanding for the sake of national defense and seems prepared to accept any future consequences. The taxes placed upon the industry amount to a 3.1% increase on the normal income tax return which every corporation must pay regardless of whether or not it benefits from the armament program. An earlier emergency measure passed in July, 1940, raised the normal tax rate to 19%, from the prevailing 18% last year and added an additional 1.9% as a special defense tax. The latest increase has boosted the rate to 24%, a levy 1/3 heavier than that of last year--the highest basic rate in history. A corporation which in 1939 earned $12.20 per common share before federal taxes paid $2.20 for such taxes and had a net income of $10. In 1940, with the same earnings, a corporation paid $2.95 per common share for taxes and reported a net profit of about $9.25 a share even with no excess profits taxes paid. This tax was designed to skim off the excess earnings. The "normal" net income for tax purposes is definedin two ways:

1. 95% of average net income for the past four years or
2. 8% of the invested capital.

A corporation is given the privilege of choosing option. All

above the base amount is taxed at a steeply graduated rate which averages about 40% on the first $500,000 of additional earnings and 50% on all above that amount. Therefore, in computing excess profits taxes a company must determine its net income after making allowances for the higher normal income rates which now prevail. Then they must relate this net profit to invested capital to see whether or not the return is more or less than 8%--if more, then the 8% capital base is chosen; if less, the four-year average base.

In some companies where capital investment is generally heavy and earnings in recent years have been low, there is room for a sizeable expansion of profits before the ceiling set by the excess profits tax is reached. The United State Corporation falls under this classification.

(1)

	Book Value	Estimated 1940 earnings before excess profits tax
United States Steel	$119.17	8.0
Bethlehem	122.33	12.0
Republic	34.18	2.5
National	60.47	7.5
Inland	62.43	7.50

	Rate on Book Value	4 year average earnings	Estimated 1940 earnings after excess profits tax
United States Steel	6.7	3.19	* $ 8.00
Bethlehem	9.8	3.87	* 11.00
Republic	7.3	1.08	* 2.50
National	12.4	5.69	6.60
Inland	12.0	6.61	7.00

*-will probably use 8% return on invested capital option

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1. Barrons. October, 14, 1940. p.3

The Second Revenue Act of 1940 shows the impact upon corporate profits. Any new levies, and there is every indication that there will be new levies, will cut materially into earnings. However, any comparison with the past year exaggerates the picture. The United States Steel Corporation realized increased profits in 1940. In the first nine months, income taxes equaled $18,828,348 against $6,604,000 a year ago, but the net income before taxes was $88,824,419 in 1940 against $18,994,756 in 1939. State and local taxes are rising as well as federal. In the first nine months in 1940 local taxes of United States Steel were $62,746,000, leaving a balance of $69,418,070 for stockholders. There is a wide distribution in the amount of earnings consumed by taxes. It varies from 21.3% or less than the normal tax, to 43.6%. Steel is among those companies showing the lowest ratio of federal income taxes to profits because the heavy investment necessary permits substantial credits against excess profits. In the first nine months of 1940 federal taxes on income for United States Steel were equal to 21.3% of profits.[1]

Estimated Effect of Excess Profits Tax on Per Share Earnings[2]

	Actual 1939 Earnings After Taxes	After 24% Normal Tax	Estimated 1940 After Excess Profits Tax	% Reduction Earnings By Excess Profits Tax
United States Steel	1.83	9.50	* 9.50	0.0
Bethlehem	5.73	14.00	*13.89	0.8
Republic	1.46	3.00	* 3.00	0.0
National	5.71	7.50	* 6.63	11.6
Inland	6.73	9.50	* 8.14	14.3

*-based on invested capital option

1. Wall Street Journal, Tax Series by Arundel Cotter, Nov. 6, 1940. p. 1 & p. 4, col. 4.
2. Poors. Steel and Iron Industry. Part II Dec. 10,1940 p.2

Although the tax is not onerous in most cases, the effect is not the same in all companies. It is quite unusual for steel in general to report earnings of better than 5% on their invested capital. Therefore, the 8% tax option would seem adequate for the present period. In 1937, an extremely good steel year, the industry, as a whole, reported earnings equal to 6.7% on its invested capital; whereas in 1929, the earnings amounted to 10%. Bethlehem's earnings are already in excess of the tax base, although United States Steel has still a way to go. However, as steel goes into maximum production, and if the war is of long duration, the 8% earnings on invested capital will unquestionably be reached and that is the time to get out of steel stocks, if return is desired.

Earnings

Eighty per cent of the total invested capital of a steel company is in its plant and fixed assets. Since demand fluctuates more widely than does the general industry production, the earnings record shows extreme gyrations between large losses and profits. At a low percentage capacity the industry cannot begin to cover its overhead expenses until it reaches a certain point. All gross profit is usually absorbed by depreciation, amortization, interest, and non-variable expenses. Once these costs are covered net profits accumulate very rapidly. They are more pronounced in thoroughly intergrated companies and further magnified wherever capital leverage is high. We must note that smaller companies, particularly those with outlets in consumer goods industries, and especially those specializing in alloys,

came through the 1930 depression in fairly good shape. Over a period of years, earnings were relatively small. Ex:

1919-1928	average return on invested capital	5.1%
1928-1938	" " " " "	2.4%

Because many years of the period 1928-1938 were in a subnormal category, it is likely that the industry would average about 6% during extended periods of relatively favorable activity. In 1939 the net return was 4%. During the long term period, earnings may be expected to gyrate widely according to changes in general business conditions.

A comparison of earnings of the various companies in the last few years shows some striking changes. United States Steel increased its earnings 460.2% from 1929 to the end of the third quarter in 1940. For the same period Bethlehem increased earnings 194.2% and Republic Steel 224.0%. If the full year earnings of 1940 were compared with those of 1939, the percentage increase would even be much greater. In 1940 the per share earnings were way above those reported in 1939. The following statistical tables show the effect of top production on earnings. A table on the distribution of the Steel Industry's gross revenue is included to show how the income is divided.

Earnings Comparisons 1939-1940
(first nine months)

	1940	1939	% change
United States Steel	$69,418,070	$12,390,756	460.2
Bethlehem	34,160,745	11,609,456	194.2
Republic	12,633,333	3,898,650	224.0
National	10,841,128	7,289,304	48.7
Inland	9,888,484	6,372,810	55.2

Earnings Comparisons 1937-1940
(full year)

	1940	1939	1938	1937
U. S. Steel	*$102,181,321	$41,119,934	D$7,717,454	$94,944,350
Bethlehem	* 48,677,524	24,638,384	5,250,239	31,819,596
Republic	* 21,113,507	10,671,343	D 7,997,825	9,044,147
National	* 15,066,340	12,581,636	6,661,651	17,801,893
Inland	* 14,450,385	10,931,016	4,916,203	12,665,318

*-preliminary figure

Common Share Earnings 1939-1940 (1)

	1940	1939
United States Steel	$5.80	$3.44*
Bethlehem	9.72	1.88
Republic	1.86	.39
National	4.92	3.31
Inland	6.07	3.92

The Distribution of Steel Industry's
Gross Revenue
Expressed in per cents (2)

	1924/33 average	1929	1937	1938	1939
Payrolls	41.0	35.5	37.0	40.5	37.0
Materials	40.0	38.5	44.0	*	45.0
Depreciation	6.0	5.0	5.0	7.0	5.5
Taxes	4.5	4.0	5.5	5.5	5.5
Interest	1.0	1.5	1.0	2.0	1.5
Dividends pd	6.5	6.5	5.0	*	2.5
Added to surplus	1.0	9.0	2.5	*	3.0

*-amount not estimated

Security Status

The comparative positions of the steel companies in the last decade, with emphasis on the last two years, offer some ground for possible forecast. The United States Steel Corporation record of earnings and dividends paid so far

1. Wall Street Journal. January 3, 1941. p.12
2. Moody's Standard Trade and Securities. p. ST-23

1. Wall Street Journal. January 3, 1941. p. 12
2. Moody's Standard Trade and Securities. p. 87-93

indicate the hazardous years she has passed. In the ten-year period 1930-1936, six years, were deficit years and five years saw no common stock dividends.

United States Steel Corporation
(year ending December 31)

	Earned per common share	Dividends paid on common	Price Range of common stock
1939	1.83	none	82-42
1938	D.3.78	none	71-38
1937	8.01	$1.00	126-48
1936	2.91	none	79-46
1935	D.2.77	none	50-27
1934	D.5.39	none	59-29
1933	D.7.09	none	67-23
1932	D.11.08	0.50	52-21
1931	D.1.40	5.50	152-36
1930	9.21	1.00	198-134

D = deficit

Undoubtedly the Corporation will be the chief beneficiary from a revival of industry, because of its broadly diversified activities and intergrations. The competitors of the extensive expansion program should improve profit margins. With 37% of domestic ingot capacity, the Corporation still enjoys a dominate role in the indsutry. The increase in light alloy and special steel productions since 1935 coupled with the abandonment of high cost plants and obsolete machinery has strengthened the manufacturing position. As of June 30, 1940, the total long term debt amounted to $360,281,000. Net working capital was $422,739,000. In 1937 earnings were $94,944,000, with operations at 71.2% capacity; whereas, in 1938 there was a loss of $7,717,000 with operations at 36.2% capacity. The outbreak of

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Ll. Fortune. March, 1926 p. 191

the war in September, 1939, quickened steel activity and profits. Earnings were $41,120,000 with operations at 60.7% capacity.[1] The year 1940 was the best year since 1930. Earnings were $3.04 a share in the fourth quarter alone. They could be higher, but the Corporation deducted $.80 a share representing pension payments for the full year in the fourth quarter. In the future this payment is to be deducted every quarter. Without this deduction, the rate would be $3.64 a share. The other best quarter was the second in 1937, when earnings were $3.43 a share. It can be said that the Corporation is at the 1937 level now and destined to approach the 1929 level with continued activity.

Bethlehem, as of December 31, 1939, has a long term debt of $182,277,000. The 7% preferred stock with a par value of $100 has 933,887 shares outstanding. The 5% preferred issue was called for redemption on April 1, 1940. In addition, there are 2,984,994 shares of no par common stock outstanding.

Bethlehem Steel (year ending December 31)

	Earned per common share	Dividend Paid on common	Price Range of common stock
1939	5.75	$1.50	100-50
1938	D.0.70	none	70-39
1937	7.64	c.5.00	105-41
1936	2.01	1.50	77-45
1935	b.D.1.00	none	52-21
1934	b.D.2.17	none	49-24
1933	b.D.5.07	none	49-10
1932	b.D.8.41	0.50	29- 7
1930	b. 5.13	6.00	110-47
1929	b. 10.89	3.50	140-78

D deficit
b based on capitalization after merger
c January, 1938 - paid off preferred 12/24/37

1. Poors. Steel and Iron Industry Survey. pp. S2-47-48

Although Bethlehem has been considered as not being in as difficult financial straits as the United States Steel Corporation, her record is very similar to the parent company. Price range fluctuations are more erratic here. The war will stimulate business for Bethlehem aside from the high level of ship building which is being enjoyed. That the company will earn tremendous amounts is unquestioned, for the industry is intergrated and, moreover, owns the only steel plant on the Atlantic seaboard and can make export shipments very easily. Bethlehem is the second largest producer of iron and steel and has interests similar to those of the parent Corporation, namely, iron ore, coal, limestone, properties, railroads, and steamships. The aggressive expansion program from 1935-1939 left the company well-rounded in output production of heavy and light steel. Annual ingot capacity as of January 1, 1940, amounted to 10,240,000 gross tons. The long term debt of $182,277,000 is not excessive in comparison depreciated physical assets.

In March, 1940, the 3 1/4% and 4 1/4% bonds were refinanced saving $1,213,000 in fixed charges. Later the 5% preferred stock issue was redeemed eliminating $933,900. prior charges. Furthermore, in July last year, the company arranged the refinancing of the 3 1/2% debenture issue. It was called on August 26, 1940 - an additional saving. Working capital at the end of 1939 was $187,340,000 - a mark exceeding that of the previous ten years. In the last war, the company was largely a munitions and a shipbuilding plant with light capitalization and high earnings. The present conflict finds Bethlehem a

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well-rounded steel industry with a large capitalization and already at a point where the Excess Profits Tax cuts into its earnings. Earnings over the past five years were

1940	$14.04	a share (largest in company's history.)
1939	5.75	
1938	D. .70	
1937	7.64	
1929	11.01	

It is estimated that the Excess Profits Tax is liable to cut in after earnings exceed $12.50. [1]

1. Barrons. February 3, 1941. 1.13

Chapter V

Conclusions

From our survey of the steel industry in war economics, we find several items stand out sharply. In the sphere of production we notice marked contrast. Total steel plant capacity in 1914 was 3,300,000 net tons whereas today it is 6,600,000 net tons. Steel operations then, at the outset of the war, were running at 59% of capacity and did not reach 90% until 1916. Today, at the beginning of the war period, we are running at 90% capacity operations. However, there is a difference. The last war was rather slow ingetting started. The "blizkrieg" had not been invented and warfare was mainly trench warfare. Everybody realizes today that England's fate rests upon our ability to supply her with the things she needs- ships, airplanes, and ammunitions. These require steel. Therefore, it can be said that the fate of England and our stake in the present conflict rests upon the fast productability of our steel mills. The following table illustrates the industry's rated annual capacity in net tons for producing ingots and steel castings from 1918 to date and illustrates the tremendous capacity existing today in comparison with that of 1918.

As of Dec. 31.	Ingots	Ingots and Steel for castings*
1918	58,630,000	61,021,000
1929	70,636,000	72,985,000
1934	78,103,000	78,452,000
1937	79,593,000	80,186,000

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As of Dec. 31.	Ingots	Ingots and Steel for castings*
1918	58,630,000	61,091,000
1929	70,850,000	72,985,000
1934	76,103,000	78,459,000
1937	79,895,000	80,188,000

1938	81,238,000	81,829,000
1939	80,951,000	81,619,000
1940	83,581,000	84,152,000

*In figures for 1934 on total capacity includes that part of capacity operated by companies producing steel ingots. (1)

Prices

Prices of steel products in the last war soared to unprecedented heights. Very often prices changed weekly. Steel was experiencing a runaway market. When the United States entered the war in 1917, the War Industries Board stabilized prices at levels which enable the high cost producer to make sizeable profits and the low cost producer to obtain banner profits. Prices had three years of unhalted rises before controls were set. The present situation sees a change. Steel prices have ahd a tentative ceiling set at the outset of the war accompanied with a threat of using force and rigid controls if the prices were not maintained. The Government is hoping to curb any possible price spiral inflation and excessive steel profits as occurred in the last war.

Labor

The one weapon labor holds today which it did not possess in the last war is the power to strike. In 1914 steel wages were low in comparison to those of today, but the cost of living was lower at that time. The adoption of the code and the recent minimum standards set by the government have pushed

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(1) After a table in Steel Facts, February 1941 No.45 p.3

1938	81,238,000	81,829,000
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wages to a higher level than has ever been attained. Average weekly earnings today have a higher buying power than they did in 1929. The National Industrial Conference Board found that wages in the fourth quarter of 1940 were 7% above the buying power of earnings in 1929. "Hourly earnings of steel workers in October, November, and December of last year averaged 86.1 cents an hour, or almost 1/3 more than the average for 1929 of 65.4 cents an hour. The average number of hours worked each week was 38.4 in the last quarter of 1940, compared with an average of 54.9 hours per week in 1929."(1)

Taxes

Taxes today are progressial andskimming off any excess war earnings. In the last war, the industry had the benefit of three years' operations before any excess profits tax came into effect. Today the situation is different. Similar to prices where controls were placed upon the industry at the beginning of the war period, excess war profits are also in force. They are not burdensome, but they are accomplishing their purpose of taking away war profits.

Earnings

While industry in the last war had a free rein as to the amount of earnings it made, today with labor pushing from one side for increased wages, with taxes pushing from the other to take away war profits, and with prices stabilized, there is

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(1) Steel Facts, February 1941. No. 45 p.2 col.3

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little possibility for any increased earnings. Price earnings ratios are low for most of the steel securities which proves the point that present as well as future earnings will probably be similar.

Future Business Conditions

It is estimated that war work, directly or indirectly, is expected to keep steel operating at 90% capacity or better for some time ahead. Improved selling prices and heavy volume are absorbing rising costs at present and should continue for the immediate future, at least. Wages will probably be raised soon, but prices will not rise in proportion. Higher taxes are likely to prevent steel from reporting much, if any, better earnings in 1941 than in 1940. Order books are crammed with business. Many small companies have sold out their capacity in many products well into the second quarter of 1941. Incoming business is active, especially tin plate and pipe and is still in excess of capacity. There may be some slackening by spring, when the demand for steel to construct armaments, plants, and cantonments, airports etc. will probably have passed its peak and when the automobile curtails its production seasonally. However, this should be offset by an improved demand for steel for the manufacture of tanks, shells, and other ordinance should appear in volume. Unless the war ends soon, the export demand from Great Britain and Canada can pick up any domestic slack. The first quarter of 1941 should see steel at 95% capacity. Whether or not this can be maintained

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It is estimated that war work, directly or indirectly, is expected to keep steel operating at 90% capacity or better for some time ahead. Improved selling prices and heavy volume are absorbing rising costs at present and should continue for the immediate future, at least. Taxes will probably be raised soon, but prices will not rise in proportion. Higher taxes are likely to prevent steel from reporting much, if any, better earnings in 1941 than in 1940. Order books are crammed with business. Many small companies have sold out their capacity in many products well into the second quarter of 1941. Incoming business is active, especially tin plate and pipe and is still in excess of capacity. There may be some slackening by spring, when the demand for steel to construct armaments, plants, and equipments, airports etc. will probably have ceased its peak and when the automobile curtails its production seasonally. However, this should be offset by an improved demand for steel for the manufacture of tanks, shells, and other ordinance should appear in volume. Unless the war ends soon, the export demand from Great Britain and Canada can pick up any domestic slack. The first quarter of 1941 should see steel at 95% capacity. Whether or not this can be maintained

depends primarily on the extent the Defense Work interferes with normal operations and with the major consuming outlets. Some interference is expected, because of possible material and labor shortages - but it should not reach major proportions.

Therefore, it is conservative to say, assuming that the United States stays at peace throughout the year, that 1941 production of open-hearth and bessemer steels will average 90% or better and then total about 75 million tons. The industry's primary concern will not be obtaining volume, but producing it. At its peak the Defense Armament demand for steel will not exceed 10% or so of the industrial capacity to make raw steel. If 20% is allowed for the export demand, steel will have 70% for domestic production. The big volume in sight gives assurance of high profits. Standard Statistics forecasts steel stocks in the following manner. The United States Steel common idicates considerable promise and the preferred offers a good yield. Bethlehem with a continued high rate of operations assured for some time, gives evidence of a common stock above average and the preferred an attractive yield. In the case of Republic steel, favorable medium-term earnings prospects gives the common a fair attraction. The preferred is overpriced in relation to the preference stock. National has a sound stock and an above average promise; Inland with a large earning power has a stock which is one of the soundest in the group. (1)

Nevertheless, the future is uncertain and this calls for

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(1) Standard Statistics. Steel Trade and Securities, p.Stl-8

caution for operative results may not be as favorable as sales volume or output, since profit margins will continue to be resticted. Taxes may be increased. Certain material costs have already gone up. Unions are fighting for higher wages. The National Defense Advisory Commission will not permit any corresponding rise in steel prices. Therefore, near term earnings may fall below the fourth quarter net results of 1940.

Investment Principles for Steel:

1) Common stock earnings fluctuate sharply due to a wide variation in output and the leverage of relatively large senior fixed costs as well as senior charges.

2) Dividend payments are irregular with not even the preferred assured of a steady return.

3) Because of heavy capital investment, steel companies must have a fairly heavy funded indebtedness and large senior claims shadow the position of equities during periods of adverse operative results. Conversely, there is an important leverage for common share earnings of most companies in good times.

4) On the average, the return is low and profit margins narrow. The rising long term trend in labor and material costs promises to hold margins to moderate lends except in boom periods.

5) Steel stocks do not qualify for a conservative investment, but are frequently profitable medium-term commitments. Example, periods of war boom and prosperity 1914-1918.

6) Volume is essential in determining operating results.

Fluctuations in price frequently reflect the medium-term outlook for operations.

7) Only the timing and not the extent of the price movement in steel shares is indicated by changes in producing activity. Price fluctuations in individual issues may vary widely.

Besides considering the steel industry at the present time, an investor has to look into other phases of industrial activity to get a complete picture. In January, business activity continued on its upward march. The presentation of the Federal Budget assured more defense contracts to the amount of 600 million dollars. This naturally means a high level of business activity and the nation's credit position has all prospects of inflation - at least, until Congress acts in the Federal Reserve Board's recommendations by which they hope to curb it. Banks are increasing their holdings of government bonds and it is certain that the supply of good bonds on the market will be heavy and consequently prices will fall. There seems to be a universal agreement as to the necessity of having at least 20% of the funds in cash. Security prices are overshadowed by the expectation of unfavorable war news.

Interest rates have had their share of attention in the present program. If Congress adopts the proposal of the Federal Reserve Board, it is certain that interest rates will freeze in general, thereby placing long term corporate bonds in a vulnerable position. Wartime inflation will be retarded,

but stock prices will not be directly affected, since stocks at the present moment are selling on an inflation basis. The program really aims to prevent a serious post-war relapse. Many people wonder what will happen if we are involved in a war. Just because our men are not engaged in active combat, they forget that we are really in a wartime economy and any formal declaration of war will not materially alter our present position.

The evergrowing fear of our entry into the war and the great deal of worry and pondering about it, has resulted in weak securities. The same situation existed in the summer of 1939, so that when war was declared, people were "worried out". The prevailing sentiment on Wall Street is bearish and yet, if we are actually brought into war, the country would see a further stimulation of business activity. With or without war, we are still confronted with the problems of economic upheaval and a curtailed demand when it is all over. With a high level of business activity and large supply of credit, commodity prices, demand deposits and bank debit induces rising, a bear position can mean only worry and fear of what is going to happen.

Summary

Although volume is the prime requisite for profits, the dividing line differs substantially between units. In some units, profits depend upon the relation between the level of the selling price and the cost of labor and fuel, or upon the

type of material shipped for highly finished items result in a better return, or upon the continuity of operations, or from the return on related activities. As a result, the break even point for a producer fluctuates materially from time to time and the approximation of the dividing line between profit and loss at any given time is of little or no permanent value. Since competition keeps operating margins down, even in good volume years, and overhead costs exert a powerful lever on the profit and loss showing in poor times, the earnings record is generally poor. From 1926 to 1939, the average return on net equity was about 3%. In the best single year, 1929, eleven percent was the average earned on equity and only six and s seventenths percent in 1937. Even though earnings recovered after 1932, they were sub-average, because profit margins were narrower, competition had increased and costs were higher, especially later. As a rule, year to year, earning fluctuations are of a sizeable amount showing marked sensitivity to volume changes. But with no major widening of average profits forseen for the early future, it is unlikely that banner profits will come in the near future.

In the last analysis, the business cycle is the summation of the steel business. All the companies do not rise and fall together. Some reach their peak early intthe recovery period, others lag, others show a meagre recovery, and some continue to be prosperous, after the general business recession is wide spread. New Inventions, technological improvements and

changes in supply and demand alter the status of an industry. Mature companies lose their vitality and new ones spring up. Therefore, it is necessary to study industry trends. Furthermore, since even a comparatively weak company can make money in an industry that is flourishing, while a stronger company may not be able to rise above the handicaps imposed upon it, by a declining industry proves the importance of knowing the position also.

Security Status

As to the present standing of steel securities, it has been stressed again and again that steel is not fundamentally a conservative investment. Earnings are too eractic due to the fact that steel is a basic industry and therefore in conjunction with the business cycle. No person should make the mistake of considering steel as secure an investment as public utilities. Speculation is the term applied to steel stocks. Statistical data has proven this. If a person jumped into steel in 1914 and jumped out in 1918, his investment was very profitable. Then, if he got in again in the early twenties and jumped out in 1928, he increased his financial position. And it may be similarly pointed out that if he got in during the lows of the thirties and sold out in 1937, his investment in 1914 was greatly magnified. This is very easy to say now as we look back over the period. The difficulty is to recognize the trends at the time of occurence. To do this one must be familiar with the industry, and this is the reason why a survey of the factors of production is given.

It has been pointed out that the heavy steel industry is at the smoothing-out period of its growth curve, the intensive stage, when this artificial steel war prosperity is eliminated. Light steels and alloys are coming more and more into domestic use. They are growth companies with a future. The investor must not fail to recognize this fact. The speculator already has.

From June 1940, to December of that year trading in steel stocks on the market has been regular. Approximately the same amount of stocks were bought and sold. A survey of Investment House market trading in this period shows that 19 transactions were sales and eight were purchases. However, the net changein volume was negligible. There was a liquidation of 39,720 shares and a procurement of 30,600 (1). Of this volume the distribution was as follows:

	No. shares Sold	No. shares Bought
United States Steel	2,800	21,100
Bethlehem	1,400	11,000
Republic	1,800	none
National	1,000	none
Inland	none	500

This indicates how institutional investors rated steel stocks. The sales of Republic and National may be interpreted as a step toward the avoidance of growth company securities whose return will be affected by higher taxes. Inland, besides being a well-intergrated steel producer is also a company with a diversified

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1. Investment Trust Survey by Jackson & Curtis. Brokers February, 1940.

output which will prove beneficial. Bethlehem, the last war-bride stock, will have huge earnings primarily from her ship-building and munitions plants. Although the excess profits tax will affect the company adversely, nevertheless her financial position warrants adequate earnings. United States Steel is not so vulnerable to taxes. She still has ample room for earnings before they take effect.

In general steel company earnings are not expected to show any large gain over the 1940 level. On this basis there does not seem to be any justification for a higher price earnings ratio in evaluating stock issues. If this assumption is correct, then stocks are not likely to exceed the highs established in 1940. There are "bulls" and "bears" on the market. The "bulls" stresshigh earnings, little vulnerability to excess profits taxes, increased demand and the low price earnings ratios. On the other side the "bears" question the continuance of favorable conditions which will guarantee stock rises and the effects a possible peace will have.

Steel ingot production in 1940 surpassed the previously high level of 1929 by 7%. With steel export excluded domestic demand call forth a production that was 6% below the 1929 level. Moreover, domestic production averaged only 4% over the 1937 level. In other words were it not for the huge foreign demand steel ingot production for 1940 would average only 68.5% as compared with the actual figure of 82.%. These figures indicate the extreme importance of the foreign demand for steel. Great Britain's proposed imports promise to be at an

exceptionally high level. Actually steel exports have declined in the past months and any radical increase is not expected.

The government is looking forward to a 10% increase in business in 1941. This seems to be a very big increase. On this basis domestic demand for steel will increase about 12% (Federal Reserve Board figure). If this is true then the demands for steel will support an operating capacity of 90%. In all probability it will go higher. Therefore estimated earnings for 1941 after full allowance for taxes now in force will be

	1941 possible earnings per sh.	1940 actual earnings per sh.
United States Steel	$11.45	$ 9.40
Bethlehem	13.25	13.45
Republic	3.50	3.10

a. Made on the assumption that there will be no drastic increase in excess profits taxes and no sharp increases in labor andmaterial costs.--all questionable factors.

At current prices the common stocks of these three companies are selling at about 6.0, 6.6, and 6.3 times earnings estimated for 1941. Capacity operations will undoubtedly be in effect most of the year, so that there will be periods when the annual rate of earnings will even be higher than the estimated. On the other hand at the present time the main question is how much money can steel make with capacity operations and at what rate should peak profits be capitalized?

The fourth quarter of 1940 with capacity operations is an example of the earnings possible. If earnings reach the excess profits tax level they will be approximately $12.50 per share for United States Steel, $13.55 for Bethlehem, and $4.10 for

Republic. With this knowledge the question is on what price earnings basis are we justified in expecting the stocks to sell at their highs. In the last war United States Steel sold at 3.5 times earnings and Bethlehem at 2.4 times. Price earnings ratios in 1929, 1937, 1939, and 1940 were

	1940	1939	1937	1929	(1)
United States Steel	6.1	8.0	9.3	9.8	
Bethlehem	6.9	6.7	10.3	6.6	
Republic	6.0	6.6	11.3	a.	
average	6.3	7.1	10.3	8.2	

a. present company not yet formed.

It is evident that steel earnings are not generously capitalized in boom periods and that the war abroad has influenced the present low valuation. Therefore, by applying the average of the 1939 and the 1940 ratio figures to the peak rate of earnings expected in 1941, theoretically the highs for 1941 will be

	1941 high	1940 high	
United States Steel	$87.00	$76.00	-7 x peak earnings for 1941
Bethlehem	92.00	93.50	-6.8 x "
Republic	24.50	24.50	-6.3 x "

It seems quite apparent that 1941 will not see these steel stocks exceeding the high points already established. Applying the smallest fluctuations since the last war period, between the high and low prices to the above highs, it can be estimated the United States Steel could sell as low as $50.00; Bethlehem, $67.00; and Republic, $15.00 in 1941. Using past performances as a guide it can be stated that steel stocks will probably decline in 1941 for they have always moved in a wide range. Then too there are many factors which could depress them as for example, higher taxes, higher labor and material costs, the termination

of the war and even our entrance into the war. One need not be a clairvoyant to say that some of these possibilities will become certainties.

Note: In each case earnings for the peak quarter of the year have been projected on an annual basis and the price earnings ratio has been based upon the highest price reached by the three leading steel companies at that time.

Abstract

In the foregoing chapters we have seen the position of the steel industry in the last war, its behavior in the intervening period and its situation so far in the present conflict. It is difficult to present an analysis of steel securities without going into the factors of production. Without a knowledge of the bearing of these items upon the industry no reliable analysis can be made. An investor must at least be familiar with and know the operations of an industry--not necessarily in detail but at least to have a general picture in order to comprehend the effect of fluctuating business conditions. This is the main reason why production, capacity, prices, taxes, labor, and earnings were discussed. In the last World War and the present, business conditions are similar. The year 1913 was a prosperity year followed by the depression - a severe steel depression in 1914. Then war prosperity took the lead. Similarly, 1937 was a prosperity year followed by the depression year of 1938. In 1939, the present conflict began with an artificial war prosperity here. Just how long it will last no one can definitely say, but we know that this artificial prosperity will thrive until we have two naval fleets and a huge mechanized army.

The long term trend of steel production is synonomous with the industrial growth of the nation and coincident with the business cycles. Since steel is the raw material of other

Abstract

industries, general business conditions are effective to the industry's ups and downs. This is the foundation for the belief in industrial circles that if a barometer of business is wanting, watch steel production.

The United States Steel Corporation, formed in 1901, dominates the steel industry in America and ranks first as a steel producer in the world. Bethlehem is a close running second. Both are heavy steel producers, but Bethlehem has also munition and ship-building plants which explain why she had a running start in business in the last war in comparison with the bigger United States Steel.

Steel production proved to be adequate for the needs of the last war proves that steel masters know how and can produce volume. This is still true. With prices set at a level which insured profits, coupled with a free rein to produce, the steel industry made tremendous profits in the last war and, consequently, gave its investors handsome returns. It was very profitable to hold steel stocks in the last war.

Iron and Steel ingot capacity has seen a shift in emphasis. In the early daus of steel making, pig iron was used. As time went on engineers found a way to use scrap iron and thus preserve iron ore deposits. Where once the normal furnace charge was 100% pig iron, it is now 50%, with steel scrap constituting the remaining 50%. The cheap price of scrap has been the incentive to an increased use for scrap and, consequently, the less money is absorbed in fixed charges. However, the percent-

age of both consumed varies moderately in their ratio to each other.

Price fixing or price stabilization has been the policy of the steel industry through the ages based on the belief that stable prices insure well rounded production and eliminates cut-throat competition. Instituted and strictly maintained by Judge Gary of the United States Steel Corporation, no company has sought to alter the system. When the government criticized the price structure as monopolistic, the basing system was elaborated to the Multiple Base System, but the inherent principle was never changed. However, prices are not as rigid as they appear to be on paper. Numerous price concessions are made from which the base price is the goal.

Earnings in the last world war soared and investors took part in their enjoyment for three years of war prosperity without government controls. Furthermore, the controls, fixed prices and excess profits taxes did not take effect until 1918 and at that did not curtail disbursements to stockholders severely. By keeping large earnings in liquid form, swelling working capital, refinancing, and remodeling the plants, steel shares received greatly added values after the war. The depresion of 1929 did not overlook the steel industry. It struck severely, mainly because of the enormous plant investment required and the small amount of operations.

The strength of war taxes today outshines those of twenty years ago. The levy made in 1917 did not affect the industry

as much as the present tax program will. In this war, growth companies will be hard put. Bethlehem Steel has already earned its tax base, while United States Steel still has a little way to go. The present program, taxing before dividend disemburs-ments, reduces steel securities to ones of medium attraction.

In the 1930 decade, the main problems facing the industry were ones of plant rehabilitation, indebtedness, refinancing, labor, and wages. Progressive management has coped with these problems successfully. Rehabilitation of plants has revolved about the establishment of the continuous rolling mill which has resulted in a greater use of capital investment, greater efficiency, and improved output per man. Indebtedness has been solved by refinancing and saving millions in interest payments annually. The steel industry has fought to maintain an open shop and a twelve hour day. Contoversies with the C.I.O., and N.L.R.B. has not changed the shop policy, but has reduced the work day. Steel wages were finally set at 62½¢ per hour. Today the rate has advanced to 82¢ and further increases are threatening. SSince labor is resuming its strikes, the industry is in a crucial position. Any strike interferes with product-ion, but any strike of prolonged duration will interfere not only with the rate of operations, but with the tide of events abroad. England is dependent upon our steel industry and we have promised all our aid. Labor is becoming more powerful and demanding. Moreover, Washington is not taking any active or preliminary steps to curb labor. As the labor costs go up,

the net earmings will come down and similarly the net return on investment.

The rise of light steels and alloys is the steady development of a new trend in the industry. With the continuous rolling mill as its means of supply and increased uses from various channels constituting its demand, light steels and alloys are going ahead. They are pioneer industries,now, and have the happy prospects of the expansion stage before they become staid, settled industries of the intensive stage. With a demand for substitutions and increased uses for an old product light steels and alloys are far from there hey-day. Plastics, as yet, are no threat to the steel industry. Much research and improvement is necessary before they will become a competitor.

The mechanized warfare today is placing the steel industry in all-time high levels. The pattern of events experienced in the last war are not being followed, but rather, corrected at the beginning. There will be no runaway price markets or tremendous earnings. Steel securities have risen with the inception of war, but will in no way approach the heights of the last. On the other hand, returns on investment promise to be moderate. The market investor can never be sure of a return every year. The dividend records prove this. But the market speculator who looks for appreciation rather than disbursement, provided he saw the trend at the proper time, could make tremendous gains and realize profits. Steel

securities never qualify as sound investments which yielded a return annually. There are more years of unpaid dividends than there are paid. This is mainly due to the cyclical mature of the industry and its "prince and pauper" characteristics.

securities never qualify as sound investments which yielded a return annually. There are more years of unpaid dividends than there are paid. This is mainly due to the cyclical nature of the industry and its "prices and output" characteristics.

Appendix

The copper industry is adequate to supply all needs and mines in Latin America financed by American capital can take care of any additional needs. There is more than a sufficient supply of oil and special steps have been takenoto insure high grade and adequate gas. There are enough electrical power facilities to keep industry geared. As to the strategic material necessary to steel production, the domestic production of chromium, magenese, nickel, and tin is insufficient for present needs. The output of vanadium and tungsten is insufficient and no colbalt is produced in the United States.

Although the government has authorized purchases of 100,000,000,000. of various essential war materials, such supplies are to be stored by the Army and Navy and are not to be released unless the President proclaims the existence of a state of war emergency. This may help the steel industry, but it is unlikely they will be able to get these stores to meet the increaseing export demand.

We are able to procure nickel for Canada and vanadium from Peru with no interruptions. Magenese used to come from the U.S.S.R. but Cuba has now become an important releaser. There is some domestic production which should increase with rising prices for the product. Magenese production in the United States is still costly and the ores are of low grade. To encourage magenese production, the government awarded a large contract to the Butte Copper and Zinc Co.,

Appendix

calling for 240,000 tons to be supplied in threeyears. It is estimated that at present, there exists a year's supply in the United States.

Japan used to be our chief source of tin and at present, the Defense Advisory Commission has stated that we have enough tin on hand for a period of 69 months. The government has contracted to buy 75,000 long tons from the International Tin Cartel at 50¢ per pound. From June 30, 1940 to June 30, 1941. In addition, the government is constructing a tin smelter in the United States with the intention of using Bolivian ores.

There is also estimated to be on hand a supply of tungsten filling our needs for 6 months. Molyddenum could be substituted in the many alloys that require tungsten. We have enough chromium for a period of one to three years; colbalt, however, we have none. Our chief supplies are Canada and Chile and they, in all probability, could continue to fill our demands.

> "In considering the insufficient supply of some minerals and the overabundance of others, remember that many new alloys developed in recent years, such as 'ledlay', 'corronizing process', and increased and wider uses of beryllium. Improved domestic methods of alloying metals and the greatly increased number of alloys available indicate that considerable substitutions could be made for various minerals, if the source of supply of any one of them is entirely cut off. Moreover, this very factor will nulitate against excessive price increases of such metals as was witnessed during the World War." (1)

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(1) All facts about strategic materials and the quotation are from Poor's Steel and Iron Industry Survey. p. S2-83 -24

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(1) All facts about strategic materials and the quotation are from Poor's Steel and Iron Industry Survey, p. 32-33 -34

In addition, there are seven billions of excess bank reserves and many billions of savings banks, insurance companies and other institutional investors - all of which may be used to finance expansion, if there is need of it. This explains why the United States with its great industrial capacity can do the job that lies before it. All that is necessary is time!

% of Products in Various Companies (1)
(after a table in Fortune)

	U. S.	Bes.	Rep.	J. & L.	Young.	Nat.
Bars	25	30	51	36	28	14
Plates	15	15	--	10	14	--
Shapes	11	28	--	17	--	--
Rods	11	5	3	10	4	--
Rails	12	13	--	3	--	10
Pipe	11	4	16	21	41	--
Sheets & Strip	10	3	25	--	10	62
Tin Plate	5	2	5	3	3	14

World Steel Production (2)

	World Prod.	U. S. Prod.	U. S. % of Total
1939	147306	52799	35.8
1938	116482	31702	27.3
1937	145679	56637	38.9
1936	133080	53500	40.2
1935	106698	38184	36.1
1919	63488	38832	61.2
1918	85376	49798	58.3
1917	92660	50468	54.5
1916	90221	47907	53.1
1915	72270	36009	49.8

Ll. Steel Dictator. p. 320.
2. Poor's Standard Trade and Securities S. T. p. 10
St. Se. S.T. p.10

Steel Ingot Capacity by Companies (1)

(unit 1000's of net tons @ end of 39)

	Total	%
United States Steel	27,795	34.0
Bethlehem Steel	14,469	14.0
Republic	7,840	9.6
Jones & Laughlin	3,944	4.8
National	3,808	4.7
Youngstown Sheet & Tube	3,944	4.3
Inland	3,091	3.8
American Rolling Mill	3,030	3.7
Wheeling Steel	1,960	2.4
Colorado Fuel & Iron	1,109	1.4
Pittsburgh Steel	1,070	1.3
Otis Steel	977	1.2
Crucible Steel	933	1.1
Lukens	914	.9
Allegheny-Lualum	620	.7
Sharon Steel	560	.7
Grand City Steel	403	.5
Continental Steel	364	.4
Keystone Steel	265	.3
All other	8,398	10.2
	81,829	100.0%

Weekly Activity in Steel Industry

(% of Steel ingot production to total and capacity scheduled production rates for weeks beginning Monday.) (2)

	J	F	M	A	M	J
1937	79.4	79.6	85.8	89.9	91.0	76.2
1938	25.6	30.7	29.9	32.6	30.7	26.2
1939	50.7	53.4	55.1	54.7	47.8	54.2
1940	85.7	71.7	64.6	61.7	65.8	80.3
1941	95.1	96.9				

	J	A	S	O	N	D
1937	67.3	85.5	71.6	66.1	48.6	27.5
1938	22.4	39.8	39.9	47.9	61.0	59.9
1939	38.5	60.1	58.6	87.5	92.5	92.8
1940	74.2	90.5	82.5	94.2	96.0	96.9

Ll. Poor's. Standard Trade and Securities p. ST. 15.
2. American Iron and Steel Institute. Steel and Iron p. 8.

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